APR 21 1924

Railway Age

FIRST HALF OF 1924—No. 20 NEW YORK—APRIL 19, 1924—CHICAGO SIXTY-NINTH YEAR

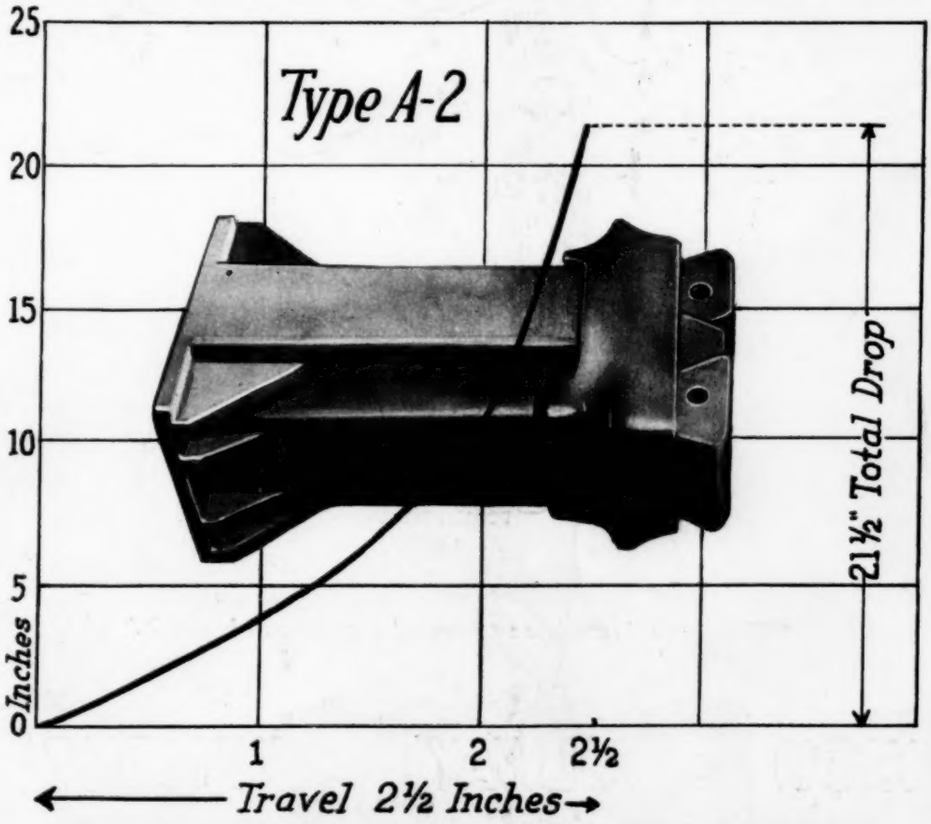
Published Weekly by Simmons-Boardman Pub. Co., 30 Church St., New York, N. Y. Subscription Price U. S., Canada and Mexico, $6.00; foreign countries (excepting daily editions), $8.00, and $10.00 a year including all dailies; single copies, 25c. Entered as second-class matter January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.

Improved

WALKER

Friction Draft Gear

2½ INCHES TRAVEL
21½ INCHES TO CLOSE UNDER 9000 lb. TUP
20 Sq. In. CROSS SECTION (*ARA*)
22⅜ INCHES LENGTH STANDARD
MATERIAL CAST STEEL AND FORGINGS *HEAT TREATED*



WALKER DRAFT GEAR CORP.

E. H. WALKER, *President*
233 Broadway
New York

WORKS:
Pittsburgh, Pa.
Hamilton, Ont., Can.

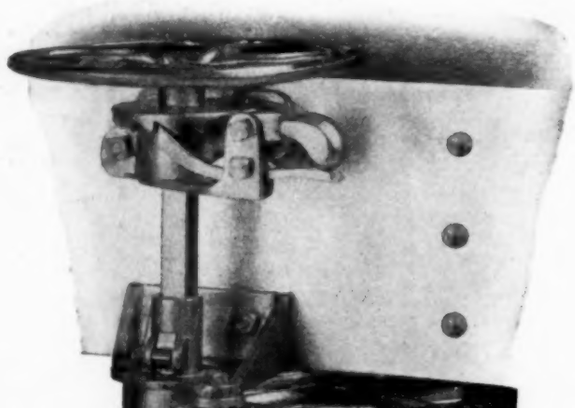
Alphabetical Index to Advertisements, Page 86 Classified Directory of Advertisers, Page 82

URECO

GEARED DROP BRAKE SHAFT

The Ureco high powered geared hand brake is furnished for stationary shaft on all types of cars, also with drop feature for flats and drop end gondolas

Highest in Efficiency



Lowest in Cost

A modern hand brake equipment that supplies the power required under A. R. A. rules.

"What you don't have to spend for repairs is profit."

UNION RAILWAY EQUIPMENT CO.

McCormick Building, Chicago, Ill.

Montreal **Richmond, Va.**

EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Grade Crossing Elimination in Toronto

In 1913 the Canadian Pacific and the Grand Trunk entered into a contract with the City of Toronto which provided for the construction of a union passenger station and the elimination of grade crossings along the water front by the erection of a viaduct to carry the railways through the city. The station was completed several years ago but has never been brought into use because the viaduct has not been built. Meantime the Grand Trunk has become a part of the Canadian National Railways, which are owned by the government. Several months ago E. W. Beatty, president of the Canadian Pacific, and Sir Henry Thornton, president of the Canadian National, presented an alternative plan for grade crossing elimination to the municipal authorities of Toronto, which would eliminate the grade crossings at a cost several million dollars lower than the original plan. Since under the contract the cost of grade crossing elimination was to be borne largely by the carriers, the city authorities lost little time in rejecting the alternative plan. The railways had no alternative but to submit to this decision. However, the Canadian National is owned by the Canadian government; it does not earn its fixed charges; and any funds for extensive additions and betterments on it have to be advanced by the government and met by bond issues or taxation. Such expenditure must be sanctioned by Parliament and, regardless of contractual obligations, the Dominion Cabinet sees the sum it is asked to appropriate for the C. N. R.'s share of the unremunerative improvement as a tax burden on all of Canada for the benefit of the people of Toronto—which is exactly what it is. The Canadian Pacific's position is not essentially different; in its case the stockholders are asked to spend millions for the exclusive benefit of the people, primarily the real estate interests, of Toronto. The existence of the contract puts the railways under an obligation which certainly could not be otherwise justified. Nor is this situation peculiar to Canada; it is just as prevalent south of the border. The Toronto case, however, is striking by reason of the fact that the ownership of the C. N. R. and its financial position make plainly evident how all such urban improvements are financed—at the expense of the owners; but to the exclusive benefit of the communities in which they are made and to the owners of real estate in those communities. A real need exists for many of the improvements which are constantly demanded in Toronto and elsewhere, but the expense should be borne by those who benefit from them.

Management Control and Forecasting

The ability to forecast the trend of a railway's traffic a few months in advance would be valuable to the property's management in a variety of ways. It would permit the executive and operating departments to prepare for future heavy traffic. On the other hand, it would make unnecessary undue preparation now often made for traffic peaks that fail to materialize. Preparation for expected heavy traffic volume is embodied in several factors. Of these, probably the two most essential are purchasing and maintenance or repair work. The railways at the present time tend to a greater degree than is desirable to buy when business is good, when everybody else is buying and when, as a result, prices are high. On the other hand, they usually refrain from buying when business is poor and prices are low. So it is with repair work. Equipment maintenance work, in particular, is carried on in greater volume when traffic is heavy and net earnings are good, whereas it is often slighted when business is poor. There are two reasons for this sort of policy. One is that the margin over costs is so small in the railway business that when business is poor, net earnings are so low that there is no money available for either purchases or for repair work. The other reason is that the railways' ability to forecast their own future trends and needs with relation thereto is not entirely what it should be. This is a feature of railway management that today is receiving greater attention than it has ever received before. It is only in a recent period, in fact, that the railways have realized the necessity of scientific study of it. This realization is being shown in the consideration of budget plans. Various railroads now have budgets for various things; railway use of such budgets, however, is at best but in an elementary stage. An essential factor in the use of budgets, or in scientific control of costs generally, is the ability to forecast. The question is as to whether it is possible for a railroad to work out a method of forecasting upon the results of which it can place reliance. There appears on another page of this issue the third article on this subject by Professor Homer B. Vanderblue of Harvard University. This article, based on a study made by one of his students, deals with the Southern Railway and is an analysis of the trend of that railway's revenue tons over an extended period of years. Professor Vanderblue's first two articles showed that the forecasting of railway trends was possible of accomplishment. The third article applies the principles, relating to railways generally, given in the first two articles, to the activities of the individual carrier. The study is, of course, but a beginning. It opens up a new line of thought that railways may find it worth their while to continue; companies in other lines of industry have done so with satisfying results.

The Problem of the Industry Track

Among the minor problems which constantly engage the attention of the railway officer few have proved more troublesome than those arising in the construction, operation and maintenance of the tracks owned and used by industries. Nevertheless, they afford a point of contact which has become a potent means for the development of more cordial relations between shipper and carrier. There has been a tendency among railway officers to consider this primarily the problem of the traffic man and the industrial agent in particular. But the discussion of the industry track which appears on another page of this issue shows clearly that operating and maintenance of way officers can also play an important part in this regard. In short, service to many shippers begin and end on their own tracks. Probably the greatest measure for the promotion of better relations with respect to industry tracks was the movement for the development of uniform contracts for their construction and maintenance, which, while they provide for less generous treatment than that which was formerly accorded to many shippers, have established a basis for fair and impartial treatment to all,

the equity of which the shippers have not been slow to recognize. This arrangement has not been without its difficulties. The requirement that all maintenance work on the tracks owned by the industry must be paid for by the owner has been a particular source of trouble, especially in the case of concerns of limited resources. In order to assure that all bills will be paid the railroads have usually required written orders from the owner before proceeding with any repairs and this has naturally resulted in much misunderstanding and delay. It has even resulted in the postponement of repairs until the need was demonstrated by an epidemic of derailments. Another effect has been the introduction of a third party, the independent track maintenance contractor. This tendency has been viewed with considerable disfavor by some because it eliminates one means whereby the railroads may render valuable service to the shipper, and it is suggested that the roads might well formulate less formal arrangements for the conduct of maintenance work which would overcome some of the difficulties now frequently experienced. But whatever the solution, the key to the situation lies in the development of closer relations between the railroad and the shipper. It lies in an arrangement for personal calls, not alone by the freight solicitor, but also by the officer directly responsible for the service rendered to the shipper in connection with the business which he is giving to the railroads.

Proposed Labor Legislation

THE BILL that has been introduced in Congress by Senator Howell and Representative Barkley at the instance of the labor unions as a substitute for the labor provisions of the Transportation Act cannot commend itself as a fair or constructive measure to anybody who does not regard the railroad problem, and especially the railroad labor problem, entirely from the labor union standpoint.

The Transportation Act always has provided for the organization of either national, regional or local adjustment boards. National adjustment boards were established by the Railroad Administration under government operation. This was not unnatural since the government was operating practically all the railways as a single national system. The labor unions sought re-establishment of national boards after the railways were returned to private operation. The railway executives, after consideration of the subject, voted by a large majority in favor of the establishment of local boards of adjustment. Finally, agreements were reached by some of the railways and some of the labor unions which resulted in the establishment of certain regional boards of adjustment. There have also been formed many local boards of adjustment.

The Howell bill provides only for national boards of adjustment composed equally of representatives of the railways and the national labor unions. Two objections to the proposed legislation regarding boards of adjustment have been urged with great force. First, a large part of railway employees do not belong to the national labor organizations, and these employees would be wholly without representation upon the proposed boards unless they did join the national unions. If they did not join them they would not be able to get a fair hearing. If they did join them the result would be to impose the "closed shop" upon all the railways. Secondly, national boards of adjustment obviously and necessarily would render decisions largely in disregard of local conditions and thereby tend to establish an iron-clad standardization throughout the country. The fact that they were in existence would cause appeals constantly to be made to them regarding differences arising between officers and men that are now settled locally, and to not only standardize working conditions, but to undermine loyalty and discipline.

The worst part of the bill, however, is that which contemplates abolition of the Railroad Labor Board and establishment of a scheme of mediation, conciliation and arbitration such as formerly prevailed under the Newlands Act. Under this proposed legislation if railways and their employees were unable to agree regarding changes in wages or working conditions, federal mediators would tender their services. If no settlement was then reached the differences might be submitted to arbitration, the arbitration board to be composed of either one or two representatives of each side and one or two umpires selected by their representatives. The Railroad Labor Board would be abolished and no permanent arbitration body would exist.

In view of experience before the war some of the arguments advanced by spokesmen of the labor unions for re-establishing the Newlands law method of setting labor controversies sound absurd. They have talked of "30 years of peace" between the railroads and their employees before the Labor Board was established, while every man familiar with the facts knows that beginning in 1915 the Newlands Act completely broke down because the train service unions repeatedly refused to arbitrate under it. Their leaders publicly declared they would never arbitrate under it again because, as they claimed, experience had shown it was impossible to get as representatives of the public upon the arbitration boards men who were impartial and who knew enough about the conditions of railroad employment to pass intelligently upon the matters presented to them.

There is no reason for believing that it would be any more possible to get satisfactory umpires in the future than it was in 1915 and 1916. Furthermore, in view of the repeated refusals of certain labor unions to arbitrate in those years and the reasons they gave, it is somewhat difficult to believe that the labor unions would be willing to arbitrate under the same plan in future.

The abolition of the Labor Board would in our opinion make it more, rather than less, difficult to bring about by negotiations peaceful settlements of controversies arising between the railways and their employees. For a long time it has appeared to us that the fact of the existence of the Labor Board has promoted peace because each side in many controversies has preferred to settle rather than take the risk that if it went to the Labor Board it would get an adverse decision. Certainly it is true, regardless of all statements to the contrary, that since the shop crafts' strike the relations between the railways and their employees have been more peaceful than for years before.

Furthermore, the abolition of the Labor Board undoubtedly would greatly increase the difficulty of getting reasonably satisfactory settlement of controversies which could not be settled by direct negotiations. When a case goes before the Labor Board it is presented to men, who, including most of the public members, have had some years' experience in its work and who, therefore, have a good working knowledge of railway service and employment. Both sides, in support of their positions, must present evidence and arguments which usually reach and influence public sentiment. Finally, the board makes formal awards which in important cases inform the public as to what a majority of its members believe are fair settlements and as to the reasons why they believe it. Experience has shown that after such hearings and the rendering of awards both parties are likely to accept the decisions reached and, whatever protest they may make, to be better satisfied than they would be with awards made by arbitration boards improvised for the particular cases. One reason why the parties are disposed to accept the awards is that public opinion is likely to accept them as fair and just, and both sides know it is dangerous to disregard public sentiment. The railways that disregarded public opinion by contracting maintenance and repair work and the shop employees who disregarded it by striking, both found in the long run that they lost by it.

The public pays all freight and passenger rates. Much the largest part of the cost of railroad transportation is the cost of labor. The greatest merit of the labor provisions of the Transportation Act is that they give the public through its permanent representatives upon the Labor Board the balance of power in settling important labor controversies. The most serious shortcoming of the legislation proposed by the labor unions is that it would deprive the public of permanent representatives in arbitration proceedings and tend to make it difficult or impossible for an intelligent public opinion regarding railroad labor controversies to be formed.

Congress would disregard the public interest if it should abolish the Labor Board and pass such legislation as the labor unions are advocating.

Three Radicals' Schemes of Railroad Valuation

THAT THE ATTACKS being made by radical members of Congress on the valuation of the railways and the rates based upon it are wholly unprincipled from the standpoint of constitutional law, of public policy and of morals is shown by three different bills to change the methods of making a valuation which have been introduced by three members of the radical group, Senator Brookhart of Iowa, Senator La Follette of Wisconsin and Senator Dill of Washington.

The radicals all agree that the principles and methods of valuation which have been outlined by the courts and the La Follette Valuation Act of 1913, and which the Interstate Commerce Commission has accepted according to its understanding of them, are all wrong. When, however, they attempt to frame legislation embodying new schemes of valuation, they disclose the fact that they are in complete disagreement among themselves both as to the reasons why the principles and methods now accepted are wrong and as to the principles and methods which should be substituted for them.

The new and improved methods of making valuations they offer, have nothing in common except the purpose of reducing, regardless of consequences, the valuation made by the Interstate Commerce Commission.

The provisions of the valuation bills introduced by Senators La Follette, Brookhart and Dill, and especially the differences between them, might be made the subject of facetious comment if they did not deal with a subject of such seriousness and importance.

Senator Brookhart's bill, which was the first introduced, directs the Interstate Commerce Commission to base the valuation of the railways upon the market prices of their securities. But in the long run the market prices of securities depend upon the net returns earned by the railways, and the purpose of valuation is to determine what net returns the railways should be allowed to earn. It follows, in other words, that under his plan the valuation would determine how much the net return earned ought to be and that the net return earned would determine how much the valuation ought to be. Of course, this process would be ridiculously illogical and impractical, but Senator Brookhart knows that the market prices of railway securities are low, and therefore, his plan has from his standpoint the merit that it would be sure to reduce the present valuation.

Senator La Follette's bill completely ignores the market prices of securities. It provides that the valuation shall be passed on the "amount of investment prudently required and utilized," and that the Interstate Commerce Commission shall "make appropriate deduction for diminishment of the investment in carrier property through abandonment or depreciation." If Senator La Follette had meant that the valuation should be based upon "actual investment," he undoubtedly would have used these words. What the provisions of his bill really mean is, that no allowance shall be made for increase that has occurred in the value of property in which investment has been prudently made, but that deductions shall be made from the actual investment when it has been imprudent or when property in which it has been made has depreciated or has been abandoned.

The result of applying this plan necessarily would be that the total valuation placed upon the railways would be substantially less than any estimate that could be made of the actual investment in them. Prudence would not be rewarded by a valuation exceeding actual investment where it has been prudently made; but imprudence would be punished by a valuation less than actual investment.

Senator Dill in his bill ignores both the basis of valuation favored by Senator Brookhart and that favored by Senator La Follette. He has, in fact, taken the lead in the great handicap the radical statesmen are running for the prize of folly. The Dill bill directs that the Interstate Commerce Commission shall ascertain and report to Congress annually the "100 per centum assessed valuations placed upon the railways" in each county of the several states and "shall give to such assessed valuations the controlling factor in determining the valuations to be used as the basic valuation for rate-making purposes." This would transfer from the Interstate Commerce Commission to all the hundreds and thousands of county assessors throughout the country the power to fix the valuation of the railroads. If the assessors in one state made the valuation high and the assessors in an adjoining state made it low, the rates and profits of the railways in the former state would be made comparatively high and in the latter state comparatively low. If all the assessors should be moved by a common impulse to increase the assessed valuation, the federal and state commissions might have to advance all the rates, but if the county assessors should all happen to be moved simultaneously by an impulse to reduce the assessed valuation, all the rates would have to be reduced. In some states, as we understand it, railway property is assessed, not by county assessors but entirely by state boards, and presumably in those states no valuation whatever would be placed upon the railways and they would not be allowed to charge any rates at all. In such states Senator Dill's bill would realize the true ambition of the radicals of putting the railways entirely out of business.

There is obviously no relationship whatever between the theories that valuation should be based upon the market prices of securities, upon "investment prudently required and utilized" and upon the "100 per centum assessed valuation" of railway property as found by county assessors except that all the radicals who propose such schemes have combined for political purposes to recklessly attack the present valuation of the railroads and are engaged, regardless of the law and the equities involved, and of the possible consequences, in devising schemes for forcing the valuation and profits of the railways downward.

The capital invested in railways is property in precisely the same legal sense as that invested in farms, factories and mines. Those who are attacking it show that they have no regard whatever for property rights; and if they considered it good politics they would just as soon propose similar legislation regarding farms, factories and mines. The economic and political institutions of the United States are founded as much on property rights as upon human rights. In fact, our entire system of law, constitutional and statutory, treats property rights as among the most fundamental and imporant of human rights. What an amazing thing it is, then, that there are many thousands of people in this country who will vote for such men as Brookhart, La Follette and Dill and support them in advocating measures of legislation which have nothing in common except the purpose of destroying property rights and which if adopted would not only result in the confiscation of railway property but in preparing the way for the destruction of rights in property of all kinds.

Liberal Maintenance Outlay

THE RAIL ORDER of the Southern Pacific which was announced last week is of more than usual interest because of its size and also because of the trend towards heavier and longer rails which it indicates. The order aggregated 131,245 tons and with the fastenings which will, of necessity, follow, represents an expenditure of approximately $7,000,000. It is one of the largest rail orders ever placed by any road, except the Pennsylvania and the New York Central, whose orders for their respective systems commonly approach 200,000 tons.

The magnitude of this order is indicative of the size of the construction and improvement program which the Southern Pacific has under way. In addition to providing for normal renewals on its large mileage of heavy traffic main lines, it will provide directly, or through the release of other rail, for the requirements of the Natron cut-off in Oregon, second track in the Sierra Nevada mountains and at other points on the Ogden line, second track and realinement across the Techachapi mountains and other heavy improvement work.

This order is also indicative of the increased liberality of the maintenance of way programs on most roads this year. While the total volume of rail orders has not exceeded and in fact is probably slightly less than at this time last year (which figures were considerably above normal), this decrease is due primarily to the delay of some roads in determining their requirements, for the tonnage already ordered exceeds that of a year ago for those roads which have awarded contracts. The same condition prevails with reference to track accessories and fastenings, demonstrating that the roads are taking the opportunity to put their properties into good physical condition.

Special interest is attached to this order because of the fact that the entire tonnage will be rolled in 39-ft. lengths. This is not only the first large road which has specified that its entire requirements shall be rolled of this length, but it is also the largest order for 39-ft. rails which has yet been placed. It is indicative of the trend of the railways towards longer rails, a tendency which the rail manufacturers must prepare to meet even though, as is claimed, it may require the alteration of certain mills. By this step the Southern Pacific is decreasing the number of joints (the weak points in the track) to be maintained and will reduce its expenditures for fastenings as well as for maintenance labor.

A review of past maintenance practice demonstrates the constant tendency towards the use of longer rails. With the development of appliances to control the expansion and creeping of the rails, with more and better ballast, with the perfection of equipment with which to handle and lay the rails and with the longer cars which are now available for their transportation from mill to track, the most serious objections to rails longer than the present standard of 33 ft. have been overcome. The Rail Committee of the American Railway Engineering Association has had this subject under consideration for some time and at the last convention reported its inability to present a definite recommendation because of the fact that the committee had been unable to determine whether the length should be fixed at 39 ft. or 45 ft. The action of the Southern Pacific will undoubtedly exert an influence in favor of the 39-ft. length.

This order is also of interest because it indicates the trend towards the heavier sections, nearly two-thirds of the order being for a 110-lb. section and the remainder for 90 lb., the previous standard. It marks a departure from the 90-lb. section which has been standard on many of the roads east and most of the roads west of Chicago for the past 10 years or more. It also indicates the decision of this road, when making a change, to make one of sufficient size to escape the common tendency to modify the section to fit existing joints, tie plates or other track fastenings. Other roads have been and are still debating the advisability of going from a 90-lb. section to one 10 lb. or 20 lb. heavier. With the constantly increasing density of traffic and weight of wheel loads and the heavy cost of the multiplicity of standards of frogs, switches and fastenings, which necessarily follow each rail section, it would appear that marked increases in sections at longer intervals are preferable to more frequent and gradual increases.

The size of this rail order indicates that the Southern Pacific is definitely committed to the newer lengths and sections. Because of this fact its action will have a marked influence on the decisions of other roads.

Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Business of Railway Transportation. Traffic—Rates—Regulation, by Lewis H. Haney. Especially Part 6 discussing public relations and regulation and current problems of regulation. 613 p. Published by Ronald Press, New York. $4.00.

Papers and Proceedings of the 36th Annual Meeting of the American Economic Association, Washington, D. C., December, 1923. Includes papers on various phases of consolidation of railroads by Prof. Ripley, Prof. Haney and Prof. W. M. Daniels, with discussions of each by members of the association. Supplement to American Economic Review for March, 1924. 182 p. Published by American Economic Association, New Haven, Conn. $1.25.

A Pocket Memo of Facts About the Future of the Railroads (etc.). Prepared and distributed by the Illinois Central System. 19 p. Published by Illinois Central System.

The Principal Factors in Freight Train Operating, by Philip Burtt. Revised edition of 1924. 208 p. Published by G. Allen & Unwin, Ltd., London. 10s. 6d.

Periodical Articles

Dust Explosions in Grain Elevators, by David J. Price. Causes, results of investigations of recent explosions, and methods for prevention. World Ports, April, 1924, p. 47-72. Discussion, p. 72-78.

The Fuel Problem. A Review of the Fuel Situation of Canada, the Problems, and Progress Towards a Solution, by Charles Camsell. ". . . Under present freight rates, it costs no more to carry coal three thousand miles across the Atlantic than it does to transport it two hundred miles by rail over here . . ." p. 186-187. Engineering Journal [Canada], April, 1924, p. 186-190.

Introducing Mr. Charles H. Markham, by A. St. John. In "Men in Wall Street's Eye" series. Barron's, April 14, 1924, p. 11.

Northern Pacific Land Grant Dispute, by Theodore M. Knappen. "Fighting to prevent railroad acquiring 3,000,000 acres now in forest reserved, the Forest Service attacks validity of all the road's land grants. Barron's, April 14, 1924, p. 3, 12.

The Virginian Prepares To Do It With Electricity, by William H. Easton. Map and profile, p. 30. Forbes, April 12, 1924, p. 29-30.

R. A.'s and Railways, by Kennedy North. Critique of nine of the railway posters by Royal Academicians ordered by the London, Midland & Scottish Railway. Five posters are reproduced. English Life, March, 1924, p. 203-207.

How Signaling Has Helped Several Roads

Prize Papers Received in Contest Explain How Signals Have Increased Track Capacity

WITH THE GROWING DEMAND for increased track capacity, railroad managements are seeking information regarding the results that have been accomplished by the installation of automatic block signals and interlockings. In order to assemble such information the *Railway Age* and Railway Signaling, conducted a prize contest for papers on this subject. That operating officers are paying more attention to the benefits of signaling, is evidenced by the number of papers received from trainmasters, superintendents, chief dispatchers, inspectors of transportation, signal supervisors and signal engineers.

At the close of the contest, these papers were submitted to E. P. Bracken, operating vice-president of the Chicago, Burlington & Quincy; C. A. Morse, chief engineer of the Chicago, Rock Island & Pacific; and J. A. Peabody, signal engineer of the Chicago & North Western, who awarded the first prize of $125 to the paper submitted by J. D. Bourne, inspector of transportation, Boston & Maine, Boston, Mass., and the second prize of $75 to the paper by Geo. S. Pflasterer, signal engineer of the Nashville, Chattanooga & St. Louis, Nashville, Tenn. Other papers receiving favorable mention were submitted by L. R. Smith, assistant superintendent, Southern Pacific, Stockton, Cal.; J. C. Hoffman, signal supervisor, Baltimore & Ohio, Cleveland, Ohio, and R. H. Smith, superintendent, Norfolk & Western, Roanoke, Va. The prize winning papers and another follow:

Congestion Relieved By Signaling on the B. & M.

By J. D. Bourne
Inspector of Transportation, Boston & Maine, Boston, Mass.

On a railroad where a continuous flow of freight and passenger traffic taxes its terminals and main lines to their capacity at all seasons, the advantage of a signal installation can best be appreciated by employees and officers in the operating department, who have labored under the dangers and difficulties of "pre-signal" days, and realize how different the conditions are on lines equipped with automatic signals, interlocking plants, staff systems, signal indicators at switches and all the other wonders of modern signaling. Twenty-two years ago the writer took a position as train dispatcher on the so-called "Hoosac Tunnel Line" of the Boston & Maine, handling the lines in western Massachusetts, up through the Berkshire Hills, and into New York state.

Line and Traffic Characteristics

The Boston & Maine had a single track out of the western gateways, from Rotterdam Junction, where we received traffic from the New York Central, and from Troy, where we interchanged most of our passenger traffic with the New York Central, and the Delaware & Hudson. We had a new double-track line out of Mechanicville, where we received most of our freight traffic from the Delaware & Hudson. There were no automatic signals on the B. & M. in those days, but we had the old-fashioned "ball signals" at our junctions with the Delaware & Hudson at Mechanicville, at West End and at Johnsonville, where our Troy line joined the main line and connected with the Greenwich & Johnsonville railway. We had no electric signals whatever through the five-mile Hoosac tunnel, but maintained an absolute manual block.

My records show that during 1901 we received from the New York Central at Rotterdam Junction 113,000 eastbound cars, and the Delaware & Hudson gave us about the same number of cars at Mechanicville. We usually received about 100 cars per day at Troy.

Mechanicville is about 80 ft. above sea level, and the grade ascends for some 52 miles to the central shaft of Hoosac tunnel, which is 836 ft. above sea level, then descends for some 35 miles, to East Deerfield, the east terminal yard, where the height above sea level is again about 80 ft. The main lines cross each other at Johnsonville at grade, and were operated as left-hand double track over what was formerly two separate railroads, to Hoosick Falls, where the eastbound main runs under the westbound, so that we had right-hand operation for the following 15 miles; the two main lines are separated at times as much as 3,000 ft. and out of sight of each other. Added to this unusual feature of double-track operation, we had the tunnel, with an ascending grade of 26 ft. from both portals to the central shaft, poorly drafted, practically always full of smoke and gas. Our road followed the river 48 miles from Mechanicville to North Adams. The Deerfield river runs through a narrow valley, from the east portal to East Deerfield, so that our trains were moving much of the time, particularly in spring and fall, through the fog banks along these rivers.

Interlocking and Signals Introduced to Eliminate Delays and Accidents

I recall the day that I began work as a dispatcher in 1901; we had a rear end collision in a fog, and from that day on until our road was completely signaled with automatics, we lived in constant dread of rear collisions. In 1901, interlocking plants were installed at both ends of Mechanicville yard, where we connected with the two divisions of the Delaware & Hudson, and the antiquated "ball signals," with their incidental delays, were a thing of the past at these important junctions.

In 1902, an interlocking plant was built at Crescent, eight miles east of Rotterdam Junction, where we connected with the Susquehanna division of the Delaware & Hudson, and this quickened the movement of trains through this point, and rendered operation more safe, particularly when using single track, as was frequently necessary.

At this time the Hoosac tunnel was the "neck of the bottle" with us, and slowed up movement to such an extent that some 800 cars of eastbound freight which the management had accepted from the New York Central had to be stored on one of our main tracks for some eight miles west of Crescent, until such time as we could move them through the tunnel. This blocked the track for seven weeks.

Conditions remained much the same until 1905 when we had a rear end collision at South River, killing six passengers. This accident occurred after a heavy snow storm,

and the flagman of the passenger did not have time to get back in the deep snow far enough to stop the following freight. After this accident we began to get some automatic signals east of the tunnel, and we had no further trouble in that territory.

From 1901 to 1907, the freight congestion around Hoosac tunnel was actually frightful, freight trains bunching at stations both sides of the tunnel, and being held on sidings from 10 to 24 hours without turning a wheel.

Our Troy road, 16 miles in length, from Johnsonville to Troy, was single track, with about 48 regular trains a day—the longest siding held 25 cars and there were four stations in the 16 miles. We had been singularly free from trouble on this part of the line, in spite of an entire absence of signals, even train order semaphores, red flags by day and red lanterns at night being our only method of stopping trains for orders. On October 4, 1906, when operating three extra sections of the Boston-Troy express, there was a serious rear end collision between two of the trains, resulting in the death of seven passengers. This resulted, at once, in the double tracking of the Troy line and the installation of automatic signals over the entire main line territory, and from that time to date we have all breathed easier, particularly when traffic is heavy or when there are snow storms and heavy fogs, for we know that the signals are there, functioning day and night, in fogs, storms or fair weather.

Electrification Simplified Operation in the Hoosac Tunnel

In 1910 the management started to electrify the Hoosac tunnel, and install up-to-date interlocking plants at both portals. We had previously installed an interlocking at Johnsonville, where our lines crossed, and with the completion of the tunnel electrification, the congestion at and around the tunnel ceased, and has never since been a factor in limiting train movements.

During the time of electrification, which consumed some eight months, we expected to have great difficulty in moving our regular traffic through the tunnel, as from four to seven work trains were employed in and at both portals of the new zone, but again the use of electric signaling devices came to our assistance, for we installed a staff system between the portals and moved all traffic over single track, under staff protection, without a single failure during the heaviest traffic.

Since the electrification, for the past 11 years, whenever it has become necessary to turn one track into single track, in case of break down, inspection, or repairs to the overhead trolley structure within the tunnel, the staff is immediately cut in and never fails to function promptly and safely.

In 1917, we thought we were well equipped to handle a peak war business, but it was noted that much time was lost in stopping first-class trains for orders to advance inferior class trains ahead of them, because of delays or other reasons. All of our telegraph stations were equipped with two-position, lower-quadrant train order signals. These delays were eliminated by changing the train order signals to give a third position, so that the new 45 degree position in daylight or a yellow light at night, was designated to authorize an inferior train to run to the next train-order signal station, regardless of superior class trains. By the use of appropriate rules this has resulted in eliminating "31" or "19" train orders for the movement of inferior class trains ahead of delayed superior class trains, and, coupled with the automatic block protection, has provided a safe and convenient method for the expeditious dispatching of trains on double track. This additional equipment involved a cost of only $1.50 per train-order signal.

This device reduced the number of train orders issued fully 30 per cent and stopped that frequent criticism of the dispatcher's work to the effect that, "He knocked out the passenger train 10 min. in getting orders to run 15 min. late, and stopping the freight train for the order delayed it so that it could not use the time anyway."

Further Installations Recommended

The Boston & Maine crosses the Delaware & Hudson at grade at Eagle Bridge, with its eastbound track, and all trains have to make a so-called "know nothing" stop. This had been going on for the past 30 years. In 1916 or 1917, we figured that nearly 10,000 eastbound Boston & Maine trains made this "know nothing" stop. If it costs $3 or $4 to bring a train to a stop and start it again, then it has cost us an immense sum by reason of our inability to finance a simple electric signal protection over this crossing to avoid this stop. More than once I have wished that I could persuade the management to install this important facility.

Ascending the grade from East Deerfield to the tunnel, all freight trains were formerly required to stop on the grade at a switch leading to the long siding at the tunnel, and call up to see if it could proceed up the main line or the siding. Failing to get authority for a distant electrically operated signal and switch for this siding to be operated from the east portal tower, we have for years maintained ground switchmen at this point. Let us hope we some time get the electric signal and switch.

Considering the foregoing facts, is it any flight of fancy to say that there are many good railroad men alive today that would not be alive if it was not for the coming of the automatic signal, the interlocking and the many other electrical devices, that have been provided on this division alone? The line has increased its capacity fully 100 per cent in 22 years by reason of signaling devices at various points and because of the automatic signals along the line. From a badly congested territory, it has emerged a wide open and well operated division, thanks largely to its electrical equipment.

Increasing Track Capacity By Signaling

By Geo. S. Pflasterer

Signal Engineer, Nashville, Chattanooga & St. Louis, Nashville, Tenn.

During the past 35 years the experience of the Nashville, Chattanooga & St. Louis has shown that congestion can be relieved, and substantial improvement can be made in train operation, by directing the movement of trains by signal indication in place of written train orders. During the past few years congestion was further relieved, and the operating efficiency increased by the remote control and operation of passing siding, and other important switches.

About 35 years ago, the management of the N. C. & St. L. recognized the importance of signaling, and installed a controlled manual block system on the main line. The control consisted solely of a "train director" who instructed the operators how to handle the trains. On this six mile installation, two miles was double and four miles single track. Over this section, two other railroads had trackage rights for all trains. This territory included three block sections with four offices, the train director being stationed in one of the end offices. The switches and signals were operated by a crude

type of mechanical interlocking, which was built in the railroad company's shops. No mechanical or electric checks of any kind were used.

This system remained in successful operation for over 25 years, during which period very heavy traffic was handled. The maximum record for one day's operation is as follows: On the single track section, 178 trains. On the double track section, 215 trains. The distinct feature of the operation was that all trains were operated entirely by signal indication without the use of written train orders. The operation was highly satisfactory and the record shows that only one accident occurred, which resulted in a slight damage to equipment.

To provide for the heavy travel incident to a national exposition some years ago, four power interlocking plants were installed on the tracks between the Union Station and the exposition grounds. Shuttle trains were operated over these tracks every 30 minutes, in both directions. On special days, trains were operated at short intervals as fast as they could be unloaded and loaded. The feature that contributed to the successful operation was that train movements were directed entirely by signal indication.

Our Union station terminal has grown in size so that it now comprises 54 miles of double main track and 147 miles of side tracks. The present traffic for 24 hours, consists of 64 passenger trains and a freight car movement of approximately 3,300 cars. The signal system now in use on the terminal, includes 13 interlocking plants, 18 miles of a.c. automatic block signals and four miles of the staff system. All train movements in the terminal district are governed entirely by signal indications, without written trains orders.

On one division where, for a distance of 47 miles, a foreign railroad operates all of its trains under trackage rights, the only signals in use prior to 1906 were train-order signals at the stations. At that time a manual system was installed with a manual home signal and semi-automatic distant signals at each of the 14 stations. The use of the "31" train-order was practically eliminated, the "19" train-order taking its place. The present traffic in this territory consists of 28 passenger trains and an average of 35 freight trains for 24 hours, the operating results being highly satisfactory. An improvement, however, could be made by the use of an automatic block system.

In 1910, the traffic congestion was so great on the single track line over the Cumberland mountains that steps had to be taken to relieve the situation. This single track section is 11 miles long and passes through a tunnel 2,218 ft. long at the summit of the grade and as the grade is 2 per cent, pusher engines are used. As the art of signaling had advanced materially, it was possible to install a combination of the best features of controlled manual-block, automatic-block, and interlocking. The system as installed in 1911, was operated from three stations, two of which were originally mechanical interlocking, but with all signals power operated and controlled by continuous track circuits. The intermediate block signals were automatic.

Prior to the installation of this system as many as 250 written train orders were issued in a day for the movement of trains over this single track section. Since the installation of the signal system, written train orders have been discontinued and trains are moving entirely by signal indication.

In order to handle the increase in traffic, in 1915, two miles of double track were constructed from the foot of the two per cent grade on the south side of the mountain. The track changes made the distance too great for the mechanical operation of the switches in the new location, therefore power switch machines (low-voltage type) were installed. The switch at the end of the double track at the foot of the grade is two miles from its point of control and, at the time that it was installed, was a record distance for the remote control of a switch. This switch has made a notable record for operation without a failure since the date of its installation. An added feature of this installation was the signaling of the two miles of double track in both directions, thus increasing the track capacity.

No record has been kept of the actual savings that have resulted from the improvement in operation under this system of signals. However, it is self-evident, that the elimination of the delays incident to the use of a large number of written train orders means that trains are kept moving instead of waiting on sidings and a corresponding saving in time and fuel is made. It is difficult to estimate the total value of these savings because of the fact that, prior to this installation of signaling, this single track section was the limiting point on the division and therefore the signaling system should be given credit for a material increase in the train capacity of the entire division.

At another point our line crosses two streams with a large island between them, and over one of the streams it is necessary to maintain a 400 ft. drawbridge. Single track extends from the north bank of one stream to the south bank of the other stream, the distance being approximately three quarters of a mile, on either side of which the line is double track. In 1917, an interlocking plant was provided for the protection of both ends of the double track, the drawbridge which intervenes, and for switching facilities on the shore where the tower is located. This plant is located in a territory over which, for a distance of 37 miles, another railroad has trackage rights for all of its trains. The heavy congestion which existed previously at this point was caused by several passenger trains being operated in this vicinity close together, and all trains having to stop and throw switches. This congestion has been eliminated and, as in other cases, trains are now operated entirely by signal indication.

As an example of what signaling will do to decrease operating costs, it is interesting to refer to an installation of a power switch machine which was placed in service about a year ago for operating a switch at the end of a double track. It is estimated that this installation will eliminate over 4,000 train stops per year at an estimated money saving of over $8,000. As the original cost of the installation was a little over $6,000, it will be seen that the saving will more than pay for the cost in one year.

It should be noted that in every case referred to above the results were obtained by providing a system of signals under which trains could be moved entirely by signal indication.

The Cash Saving Accomplished By Signals on the B. & O.

By J. C. Hoffman
Signal Supervisor, Baltimore & Ohio, Akron, Ohio

The installation of automatic signals on 11.9 miles of double-track between Warwick, Ohio, and Sterling on the Akron division of the Baltimore & Ohio has resulted in a saving of approximately $333,000 since 1917. Warwick, at the east end of this section, is the junction of the double-track main line between New York and Chicago, with the double-track C. L. & W. line running south to the Ohio and West Virginia coal fields. As Warwick is about midway in the division, 80 per cent of the tonnage trains passing through take coal and water. Sterling, on the west end of the section, is the junction between the double-track main line and the upper C. L. & W. district, which is

double-track from Sterling north to Seville. At Sterling there is a water station, and an interlocked grade crossing with the double-track line of the Erie. Therefore the double track between Warwick and Sterling handles the traffic of two double-track lines at each end of this section, and serves somewhat in the nature of a gauntlet. Although the grade is very light in either direction, the eastward and westward tracks are separated about one-half mile, diverging at the west end of Warwick yard, and at the east end of the eastward passing siding at Sterling. The distance between these tracks prevented the use of crossovers at Easton, which is midway between Sterling and Warwick. This limitation reduced the flexibility of operation, and required two, three-trick telegraph offices at Sterling, one on the westward track and the other on the eastward track.

The traffic during the summer season on the C. L. & W. district consists mainly of coal from the Ohio and West Virginia fields for the lake ports of Lorain and Cleveland, and the empties in the return movement to the mines. This traffic, added to the dense main line traffic formerly congested this territory very badly. Nine passenger trains and one express train were handled over this section daily in each direction, in addition to an average of 45 tonnage freight trains during the peak of the summer business. Serious delays were caused by reason of the superior trains.

Problem Solved by Signaling

In 1917, automatic block signals were installed between Warwick and Sterling. Following this the two, three-trick telegraph offices at Easton were dispensed with, and there has resulted an average saving of 20 minutes for each freight train handled over this territory. At least 75 per cent of the time saved is overtime, and a conservative estimate of the saving in wages alone during the peak business is $7,500 per month. The saving since the installation of these signals is approximately $60,000 per year in wages and overtime, without considering the saving in equipment, fuel, supplies, turning of power, etc.

THE NORTHERN PACIFIC BENEFICIAL ASSOCIATION expended $483,916 during 1923 for the operation of four hospitals and the maintenance of facilities along the lines of the Northern Pacific for the medical and surgical treatment of employees. A total of 67,244 cases were treated, of which the hospitals cared for 18,805 cases.

Ewing Galloway

On the Central of Peru in the Andes

Bill to Increase Locomotive Inspection Force Reported

WASHINGTON, D. C.

THE BILL introduced by Representative Cooper of Ohio, providing for an increase of 15 in the number of locomotive inspectors of the Interstate Commerce Commission and for an increase in the salary of the chief inspector to $6,000, that of the assistant chief inspector to $5,000 and those of the inspectors to $3,600 per annum, was favorably reported by the House committee on interstate and foreign commerce, which had held hearings on the bill, on April 11. In giving the reasons the committee report said the following:

At the time of the original act there were approximately 63,000 locomotives in service. This number has now increased to over 70,000 and the law extended to cover the entire locomotive and tender, including their appurtenances, yet the number of inspectors and the amount which may be appropriated remains the same. The number of locomotives in service has not only increased, but they have increased in size, tractive power, and mechanical complexity. In the latter respects alone an increased responsibility is imposed, a wider mechanical knowledge on the part of the inspectors is required, and a greater amount of time is necessarily consumed in the inspection of each locomotive. With the additional duties and the marked changes surrounding the work, it is of fundamental importance that additional personnel and appropriation be provided.

The lack of sufficient inspectors and the restrictions on the present force, due to the lack of funds, are reflected in the increased number of accidents and casualties, with a general depreciation in the condition of motive power. The law requires that it shall be the duty of each inspector to become familiar, so far as practicable, with the condition of each locomotive ordinarily housed or repaired in his district.

With the more than 70,000 locomotives coming under the jurisdiction of the law, which are operated by approximately 941 different railroads over 265,000 miles of main line, housed or repaired at about 4,600 places throughout the United States, which must be visited by the inspectors, makes this mandate a practical impossibility under the present conditions.

If it were possible for each of the 50 inspectors now provided to complete their work at each inspection point in one day, which can not be done, it would require more than three months to visit all points where locomotives are stationed, housed, or repaired, including Sundays and holidays, and exclusive of the time necessarily consumed in the investigation of accidents, travel, and other special duties required.

The chief inspector's report for the fiscal year ended June 30, 1922, shows that there were 1,913 points where no inspections were made by any inspector during the year. During the fiscal year ended June 30, 1923, there were 1,782 such points where no inspections were made because of inadequate inspectional force and lack of sufficient funds.

The number of accidents during the fiscal year 1923 resulting from the failure of some part or appliance of the locomotive or tender increased 117 per cent, the number killed 118 per cent, and the number injured 120 per cent, over the previous year, while the miles per engine failure, as reported to the commission, decreased as much as 50 to 70 per cent.

The percentage of locomotives inspected from defection by the Federal inspectors increased from 48 per cent during the fiscal year 1922 to 65 per cent in 1923.

The work required of the bureau of locomotive inspection of the Interstate Commerce Commission is and has been for several years seriously handicapped by insufficient appropriations and inadequate number of inspectors. This condition has been generally recognized and was brought to the attention of Congress by the Interstate Commerce Commission in its thirty-fourth, thirty-fifth, thirty-sixth, and thirty-seventh annual reports, in which it recommended:

That the boiler inspection act, as amended, be further amended to provide increases in the number and salaries of inspectors.

The commission further brought to the attention of Congress very forcibly in its thirty-sixth and thirty-seventh annual reports the necessity and reasons for increasing the number of inspectors.

There was attached a memorandum of Gen. H. M. Lord, director Bureau of the Budget, approving this bill, together with a letter from the President of the United States to the author of the bill.

S. A. E. Discusses Future of Gasoline Rail Car

Meeting at Chicago Addressed by Railroad Men and Manufacturers Who Have Studied the Problem

THE MIDWEST SECTION of the Society of Automotive Engineers on Friday evening, April 11, held one of the most important meetings yet arranged for a discussion of the development, to date, and future possibilities of gasoline rail cars in steam railroad service. Preceding the main meeting the members of the society and guests had dinner at the Engineers' Club, Chicago, then adjourning to the rooms of the Western Society of Engineers which were filled to capacity.

The large increase in gasoline-operated equipment on steam railroads in the past year or two has brought to the fore in a striking manner the question of just what kind and amount of traffic can best be handled by this equipment, and to what extent its more general use by the railroads would be justified. The manufacturers' view of this problem was presented to the meeting by Col. M. L. McGrew, representing Mack Trucks, Incorporated, Chicago, who interrupted his talk long enough to show moving pictures of gasoline rail cars now in successful operation. The two other principal speakers representing the railroad point of view were E. J. Brennan, superintendent motive power of the Chicago Great Western, Oelwein, Iowa, and E. Wanamaker, electrical engineer of the Chicago, Rock Island & Pacific, Chicago. These papers are here presented in abstract.

Development of the Modern Railway Motor Car

By Col. M. L. McGrew
Representative, Mack Trucks, Incorporated, Chicago

Because this country has been such a tremendous user of mass transportation over long distances, almost the entire energy and genius of development has gone into the big things of railroads. The user of the small amount of transportation has been going elsewhere for service, and bus and motor truck routes are springing up all over the country to take business away from the railroads. In the aggregate there is a large amount of this small unit transportation which can produce a good profit for the railroads, provided they have the right equipment to handle it.

Old Equipment Uneconomical

Antiquated, worn-out equipment cannot be used economically to handle small unit transportation. The operating expense of this equipment is much too high, and in the case of passenger service in most places the public demands something better than an oil lighted coach of the vintage of 1870. Gasoline propelled rail cars, after 25 years of pioneering, have demonstrated their ability to meet the needs of this small unit traffic.

During the present year, manufacturers have been developing cars having a useful car floor area 9 ft. wide and approximately 55 ft. long. Cars of this size weigh 60,000 lb. or more when loaded and require one horsepower for each 500 lb. of weight. Less power than this does not give satisfactory performance, and more power means unnecessarily high operating expense.

Cars equipped with large single engines and mechanical transmissions, are operating successfully. The company I am connected with has designed and built one of these which is now satisfactorily going through severe operating tests. These cars can be built lighter than the storage battery or gas electric cars and, consequently, require less power to equal the performance and carrying capacity of the heavier types. Their mechanical transmission is highly efficient, which gives this type of car a fundamental advantage over the others. The disadvantage is the need of engines of higher power than those for which there is any market outside of the rail car field, which means that quantity production of their engines with resultant low price and complete interchangeability of parts is not possible. The clutches and transmission gears are necessarily much larger than those of motor trucks and make gear-shifting difficult. The solution of the problem is in the use of two power plants on each car, properly synchronized, so that both can be used simultaneously to propel the car.

The real problem of developing a multiple unit control for rail cars has been the matter of having sufficient confidence in the power units so that they could be operated without attendance. The motor truck motor with which the writer is familiar is a dependable unit which can be left running for hours out of sight and hearing. The repair parts for these motors are available at almost any population center where a motor truck is used. Power is distributed to only one axle on each truck and at the same time there is insurance against complete break-downs in that even with the failure of one unit, it is always possible to come home on the other unit.

The Field for Rail Motor Equipment

Considering the successful rail car units in use at the present time there is evidently no excuse for the continued existence of the two or three car steam passenger train and there are some places where even the four or five car passenger train might be replaced by gasoline rail cars. The obvious location for the gasoline rail car is, of course, the non-paying branch line where the abandonment of all service is being considered. An equally good location for rail cars, especially for operation in multiple unit trains, is the in-between and local service on main lines. A third possibility for the multiple unit trains is in connection with the electrified terminals in large cities. There is a definite zone around these large terminals beyond which it does not pay to electrify, on account of the tremendous first cost and sparsity of traffic, but beyond the electrified zone there is a demand for a certain amount of suburban service for which the gasoline rail car is ideal.

So far, with very few exceptions, all gasoline rail car development has been in the field of passenger service. There is no reason, however, why an almost equal field of operation could not be found in the field of freight. The American freight car is too large a unit of transportation for many conditions. It is well adapted for the long distance mass transportation in this country but the European type of freight car is more suited to much of the local freight service in this

country. Railroads are alive to this condition and are working on various schemes to get around the difficulty.

There is no question but that the rail car has come to stay.

The Mack Two-Motor Rail Car

The Mack ACP two-motor rail car is the result of several years of effort and experimentation. After deciding on the development of an interchangeable universal power unit, the question that arose was the size of this unit, and 60 hp. was conceded to be the most satisfactory size for the individual power unit. One of the points leading up to this choice was the desirability of a drive to not more than one axle of each power unit. If it is necessary to divide the power from one prime mover between two axles the mechanical complications of this flexible drive are considerably increased.

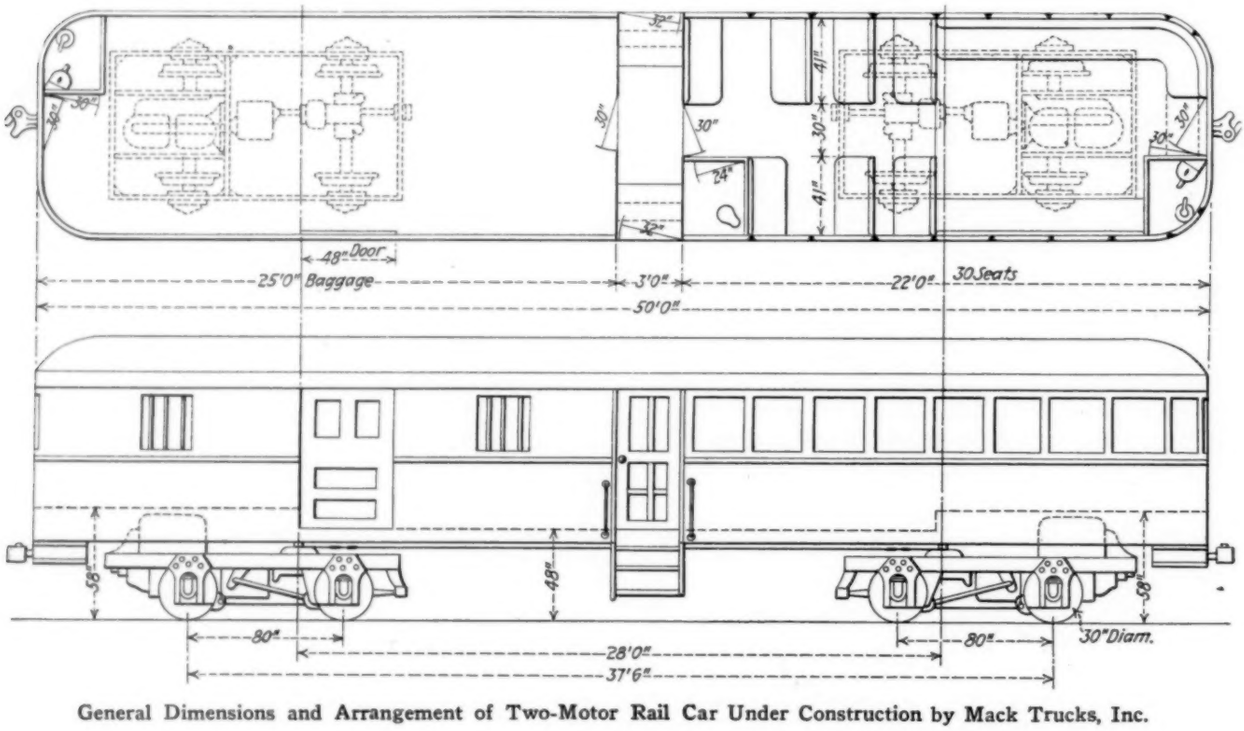
Moreover, 60 hp. is just about the power of the largest size truck motors and engines can be used which are being produced in quantities of thousands per year. A large number of other standard motor truck parts are used in this design, such as shafts, cooling system, driving gears, clutches, etc.

The clutch employed has been proved out in many years of use and does not transmit so much horsepower as to require a special design.

The four-wheel power truck, the first element in the ACP design, is complete in every detail, having a gasoline supply system, cooling system and exhaust system as well as air compressor and electric generator. The second element consists of the car body which may, within certain limitations, be of any design to suit the needs of the purchaser. The third element is the control equipment, somewhat similar to the equipment used on subway and elevated trains, consisting of a controller for the engine and shifting of gears, an air brake valve, as used on many interurban cars, and an indication system to furnish the driver with certain indications as to the operation of the power units. The only other equipment necessary on these cars is a storage battery to go with the generating equipment, which also serves to operate the control as well as the lights. With these three elements, namely, power truck, car body and control it is possible to make up a large number of combinations to suit conditions.

In addition to the great flexibility in the combination of power units, car bodies and control, it is possible to secure further flexibility by variations in the final driving gear ratio on the power units. A power unit may be built which will have a maximum safe operating speed of 60 miles an hour or a maximum safe operating speed of 30 miles an hour with corresponding differences in tractive forces available.

Each truck will be furnished with a power plant consisting of a Mack AC 5-in. by 6-in., four-cylinder engine capable of developing a maximum of 60 hp. Through a dry disc clutch and universal joint this engine is connected to a transmission, which in turn through a universal joint is connected to the gears on the driving axle. These drive gears consist of a dual reduction drive, in which the drive is connected to a bevel gearing, which in turn is connected to spur gearing mounted on the axle. Provision is made at this point for several different gear ratios depending on the service in which the car is to be placed. The engine is equipped with the other necessary auxiliaries, all mounted on the same truck and consisting of cooling system, gasoline supply and exhaust system.



General Dimensions and Arrangement of Two-Motor Rail Car Under Construction by Mack Trucks, Inc.

The control of gear shifting is accomplished electropneumatically. The actual shifting of gears is accomplished by air cylinders whose pistons are connected to the shafts carrying the shifter forks and clutch lever. The gear shifting on a number of power trucks is perfectly synchronized. There are three steps to this operation; first, bringing the gears to neutral, which includes, of course, first throwing the clutch out; second, shifting the gears into the new position; and third, allowing the clutch to come in again. Each of these operations must be complete on all trucks before the succeeding operation can start.

The various engines on the different power trucks driving a car are all mechanically connected together through the track and therefore will run at the same speed. In case the wheels should slip on any one truck, the governor on that engine will prevent it from running away. The division of power between gasoline engines driving the same load and running at the same speed with identical throttle settings,

will divide up on an almost equal basis, depending on such slight questions as carburetor setting, condition of the engine, compression, etc.

One other feature provided on these cars is the matter of return indication from the engines to the driver. On each engine a contact device is driven from the cam shaft, which makes a contact every revolution of the cam shaft or every second revolution of the engine. It is evident, therefore, that these indicator lamps will flash every second revolution of each engine and will indicate to the driver the approximate speed at which the engines are running, as well as whether the wheels are slipping on any unit, and that the ignition circuit is operating. Locating the driving motor on the truck results in giving clear baggage space, reduction of vibration in the car body to a minimum, avoidance of gasoline fumes in the car body, additional reliability owing to the use of two power trucks and no necessity of tying up the car for motor repairs.

Motorized Equipment on the Chicago Great Western

By E. J. Brennan

Superintendent of Motive Power, Chicago Great Western, Oelwein, Iowa

Our first installation of this type of equipment was in 1910 during which year we placed in revenue service three gasoline driven McKeen cars, at present numbered 1,000 1,001 and 1,002. These cars were equipped with what is known as the type A motor, a 200-hp., six-cylinder, 10-in. by 12-in., slow speed reversible four-cycle engine with overhead valves and open crank case. The motors on all McKeen cars, regardless of the type, are bolted and riveted to the front driving truck frame. Our experience with these cars has developed that the four-cycle reversible type motor was and is the direct cause of many difficulties owing to the fact that there are twice as many points of wear in the cam shafts and timing arrangements and this, including an air starting apparatus, makes rather a complicated unit. The ignition system consists of a Bosch high tension magneto D-6 special, which is constructed to run in either direction, and a timer with six vibrating coils using either storage batteries or dry cells. The carburetor is located in the center of the engine and has long intake manifolds.

In the center of the crank shaft is located a sprocket wheel from which a 4-in. Morse silent chain carries the power to the clutch and transmission located on the driving axle. Only two speeds are used—low and direct—and as the engine is reversible they are used in either direction the car is operated. When necessary to resort to the reverse motion, as is quite frequently experienced on a single track railroad, it is necessary to stop the engine and start it in the reverse direction. The ordinary air compressing equipment has been found inadequate owing to the heavy demands made on compressors in present day service in that frequent highway crossing signals must be sounded with the air whistle which seriously depletes the supply of air and causes delay until the pressure is restored in order to turn the engine over in the reverse motion. The auxiliary air compressor which is a combination gas engine and air pump is a part of the equipment and does what we consider a fair job when the compressor and engine are in first class mechanical operating condition. We have gone into the foregoing in detail to give an idea of some of the complications of this type of equipment.

Experience with McKeen Cars

On motor car No. 1,000 we installed in 1915 a type C motor which differs somewhat from the type A in that it has a tee-head engine and a greater water capacity around the cylinders and valves. This motor also has a closed crank case with the splash system of oiling. On the type A motor each bearing is lubricated through an oil pipe from a 14-feed mechanically operated lubricator. Such intricate mechanism in railway service is too easily damaged or broken so as to cause hot bearings. This is especially true in locations where the railroads are obliged to use the cars on branch lines where there are no shop facilities. Considerable reductions on maintenance costs have been realized through the use of the type C motor as compared with the type A, but first class workmanship is necessary on the connecting rods and crank shaft bearings in order that the full benefit may be realized from the type C motor in this respect. The type C motor operated at a very high compression, approximately 6⅓ atmospheres, and when being used on grades or for pulling a trailer, was very noisy, making it uncomfortable for passengers. Brass rings ⅞ in. thick, applied under the cylinder head, reduced the pre-ignition and eliminated feeding so much water, increasing the power with a corresponding reduction in fuel. This change reduced compression to approximately 4⅞ atmospheres.

On car No. 1,001 we have applied Duff kerosene carburetors which have an individual carburetor for each cylinder. These are much more flexible, the car performs better because the engine can be balanced and a more even torque is obtained than with the standard equipment.

These cars operate for about 35 cents a mile, total operating and maintenance costs, with the exception of motor car No. 1,000 which, in regular service, pulls a 35-ft. trailer for mail and express and this two-car unit averages 40.14 cents a mile.

The coach of the McKeen car is well constructed and built to overcome wind resistance. The body proper is 72 ft. long and has a seating capacity of 83 passengers. The heating of the car is accomplished with coils from the engine but owing to the fact that we operate McKeen cars in Minnesota where the climate is rather cold, we have, as a measure of safety, installed coal burning stoves in the event that failure should make it necessary to stop the engine.

The weight of the McKeen car empty is approximately 35 tons. Our experience encouraged the use of a lighter, more flexible unit of sufficient stability to be operated in the same service, yet simple enough so that where it is used in branch line service the average mechanic or engineer can successfully make minor repairs and keep the cars away from the repair shops longer.

Performance of the Russel Two-Car Train

Our next addition of gasoline driven equipment was the installation of a two-car train consisting of motor coach and trailer built by the Russel Company, which was placed in service in the early part of 1922. The motor coach of this train is 28 ft. long with a 12-ft. baggage space, carries 30 passengers and weighs 28,000 lb. The trailer is 32 ft. long, weighs 17,000 lb. and has a seating capacity of 36 passengers. In the development of this train the railway engineers worked with the automotive engineers to some extent but were governed to a large measure by the advice of the automotive engineers. As a result, this train was originally equipped with a four-cylinder 65-hp. Wisconsin engine. It needed only a trial trip to develop that the engine was not of sufficient capacity and immediately a six-cylinder 105-hp. engine was installed. After this change was made and the train placed

in revenue service we found that the radiation supplied for the 65 hp. engine was not sufficient for the 105 hp. engine and that the drive was not substantial enough. Frequent changes have been made in this unit and at the present time we are installing heavier shafts and joints of more than double the strength of the original equipment from which we are sure we will derive a great benefit.

The original trucks under this train were equipped with ball bearings of sufficient capacity to carry the load but not to withstand the frequent severe road shocks encountered in railway service. We found that the balls would chip which would, of course, lock the bearings. The trucks were also rigid, causing undue vibration and no matter how we bolted the various appurtenances to the trucks, they would invariably shake loose. This, with frequent complaints from the passengers as to the riding qualities, made it necessary to change the design.

The original oiling system was apparently of sufficient capacity for commercial use but would not properly supply the engine and bearings on the scheduled runs in railway service, making it necessary to apply a larger oil pump which carries about 40 lb. pressure on the crank shaft at full speed. With the original oiling system we experienced an average of one connecting rod failure each week but since the oiling system has been increased to a greater capacity we have experienced periods of four months before it would be necessary to remove even a very thin shim.

This two-car train operates between McIntire, Iowa, and Waterloo, making the round trip every day, a distance of 184 miles. Between Oelwein and Waterloo, a distance of 26½ miles, with three intermediate stops the schedule is 50 min., which the train makes daily without any apparent trouble. The heating system in the motor coach is from the exhaust of the engine but the trailer is heated by an Arcola open type hot water circulating system. The original starting and lighting systems were connected to the same storage battery and during the layover period at night when the train was being cleaned and the lights were used even for a short period the battery would be exhausted to the point where there was not energy enough left to work the starter. To overcome this we installed an independent generator and battery for the lights. Notwithstanding the many features in this train which were really of an experimental nature and needed additional engineering, we were not at all discouraged but kept improving and strengthening as weaknesses developed and with it all our records indicate that this train is operating at a cost now of about 28 cents per mile.

Our experience with the McKeen cars and then with the Russel train taught us that any future units, particularly two-car trains, must necessarily be built—first, of light construction and, secondly, of sufficient ruggedness to operate on steam railway lines.

A Service Motor Car Next Installed

Our next addition of gasoline driven equipment was our single unit M-400, purchased from the Service Motor Company, Wabash, Ind. This car weighs about 30,000 lb., has a seating capacity of 38 passengers and is equipped with model 399 special Midwest 4¾-in. by 6-in. four-cylinder engine which develops approximately 65 hp. This car is being used very successfully on what we consider a light run operating between Shannon City, Iowa, and St. Joseph, Mo., making the round trip of 185.2 miles every day. To date this car has operated a total of more than 60,000 miles without receiving a thorough overhauling but this must necessarily be done before another 5,000 miles is completed. This unit operates very successfully in the service to which it is assigned. The territory is level, the schedule slow and while the number of miles run per day is equivalent to the mileage made by the Russel train, the service is not nearly as severe.

The car stops and starts with very little delay and owing to this we have inaugurated a new set of motor stations at highway crossings. These have been the means of increasing the passenger business for this particular unit and it has gained considerable popularity among the residents along the route. The drive of this unit is in reality to all four wheels of the front truck, using Peters and Fabroid joints. There seems to be a difference of opinion with reference to the shock absorbing qualifications of these joints but regardless of this we have experienced no trouble with the transmission assembly on this car. Should the running time of this car be shortened or the service made more severe, some refinement would be required in order to reduce the maintenance cost.

The Sykes 225-H.P. Motor Train

The service to which the two-car Russel train was assigned became popular with the traveling public and we soon found the need of a train of greater capacity. We then developed, in co-operation with the Sykes Company, a larger motor coach and trailer and in July, 1923, installed on our line motor coach No. M-205 and trailer No. MT-206. The motor coach is equipped with a 225-hp. Sterling Dolphin marine engine, equipped, as far as we know, with every modern improvement. The car has a seating capacity for 30 passengers and a 16-ft. baggage space. The trailer seats 44 passengers and is equipped with reversible seats, thus avoiding the necessity of turning the trailer. This train is operated daily between Waterloo, Iowa, and Des Moines, a distance of 216 miles a day, and has proved to be a very successful venture as compared with our previous experience. Many refinements were incorporated in this train from experience gained with our former units of equipment. We have long since developed that gasoline equipment designed and built for commercial service will not give the best results in railway service. The parts throughout the equipment must be more rugged in construction in order to operate successfully and at a conservative cost. This condition must necessarily obtain owing to the fact that the same operator is not with the equipment every day in the month.

Our gasoline trains are handled by our steam enginemen, who have spent the best part of their lives in railroad service operating steam locomotives and, owing to the agreements between the company and men, changes in the personnel of the crew occur which will not be advantageous to the economical performance of the trains until a thorough working knowledge of the various units of equipment is obtained by the men to whose lot it falls to operate these machines.

This particular motor train has operated so successfully that we have on order at the present time two more trains of larger capacity which have been somewhat refined in detail over the present equipment but not in the general design. A few minor defects have developed in service up to this time but as they occur they are corrected and redesigned to permanently overcome the objectionable features. Our figures indicate that this train is operated at an average cost of 24.79 cents per mile, including operating and maintenance costs.

In addition to the above we have on order with the Electromotive Engineering Company, a gas electric single unit car which will be delivered to us in the near future. Mention is made of this that you may thoroughly appreciate the extent to which the Chicago Great Western has gone into the use of motorized equipment in order to reduce our operating costs and to develop from actual experience the best type and style of equipment by which to accomplish this end.

Conclusions from the C. G. W. Experience

For the sake of comparison some interesting records of the cost of operating the various units of equipment are given in the table on the next page.

From our experience with the gasoline propelled cars it

would probably be well to mention a few requisites for stability, reliability and low operating and maintenance costs. First, a motor of sufficient capacity should be installed so that it will not be required to develop more than 60 to 65 per cent of its power rating except in cases of emergency. For obvious reasons the builder applies to his motor a rated horsepower, but in actual experience the engines do not develop the horsepower rating applied nor would it be safe or economical to permit them to perform regularly at a speed that would produce the rated horsepower. As an illustration, in our notes we refer to the McKeen car as being of 200 hp. capacity when, as a matter of fact, at 450 r.p.m., equivalent to 40 miles an hour, we get a maximum of 182 hp. With the Sterling Dolphin marine engine we have found a safe, consistent speed in steam railway service to be approximately 1,125 r.p.m., equivalent to 50 miles an hour, and at this rate we develop 165 hp. It is well that these facts be borne in mind in the future development of motorized equipment on steam railways.

The matter of lighting arrangement and equipment has not been mentioned but there is considerable room for improvement with respect to these two necessities. Some of the original installations of lighting fixtures followed automotive practice, using the Bayonet type of lamps but we found them unsatisfactory and had to resort to the use of the standard Edison base lamp. We have found the center type of lighting to be the most practical and economical as compared with the side illumination and the 25-watt Mazda type C, 30-volt lamps to give us the best service.

The present system of generation and storage, in our opinion, could be materially improved through the use of an axle-lighting equipment and a device of this character consistent with the size and type of gasoline propelled cars used on steam railroads must be developed. Such an axle lighting device could be attached to the motor car and the trailers illuminated by train line connectors.

The comfort of the passengers is a very important requisite.

Make of car	Russel two-unit M-200, MT 201	Sykes two-unit M-205, MT 206	Service M-400	McKeen two-unit 1,000-1,025, type B motor	McKeen 1,001, type A motor	McKeen 1,003, type C motor
Period covered	October, 1922, to December, 1923	August, 1923, to January, 1924	November, 1922, to January, 1924	May, 1923, to December, 1923	October, 1922, to December, 1923	July, 1923, to December, 1923
Total cost per mile run, cents	27.29	24.89	24.71	40.14	35.93	24.86
Miles run per gallon gas	4.72	2.44	5.47	1.41	1.88	2.19
Miles run per pint lubricating oil	15.72	17.12	17.52	2.95	8.78	4.74
Miles run during period	36,776	30,587	54,252	17,570	45,006	24,763

The cooling capacity for the motor, must, necessarily be ample.

All bolts and nuts, wherever possible, throughout the entire equipment should be U. S. standard instead of S. A. E. standard.

Accessibility and standardization of parts is important so as to reduce as much as possible the number carried in stock. This is very important owing to conditions necessitating moving the units from one division to another. In this event the fewer spare parts that must be carried, the less money will be tied up.

When the gasoline driven equipment is to be assigned regularly to a branch, the motor should have sufficient capacity to handle the equipment for which it was designed plus a box car or coach, even though this be accomplished at a greatly reduced speed. Our experience has taught us that this is quite often necessary.

Motorized Light Service Rail Transportation

By E. Wanamaker
Electrical Engineer, Chicago, Rock Island & Pacific, Chicago

For so-called light service traffic, it is generally acknowledged that the steam locomotive has proved uneconomical and unsatisfactory and the eyes of railway managements have turned longingly to the possibilities of the internal combustion engine drive as the possible solution. True, electric storage battery cars may be very satisfactorily and economically used in a limited field; in another limited field straight electric cars may be used to advantage, but the internal combustion engine drive seems to offer for the major portion of the light traffic field a far more favorable solution.

The writer strongly feels, after 10 years' study and experience with the adaptation of the internal combustion engine to railroad service, that it offers excellent possibilities, but that no particular benefit can be derived by making minor improvements to such equipment as has been built for other service. It is necessary to work along the lines of radically changed development. The necessary preliminary steps have now been taken to make these developments, and we may soon look for a tremendous sweep of internal combustion engine drive over our railroads.

In this development there are three prime requisites: (1) Economical production of such equipment; (2) Economical operation of such equipment; (3) High quality of service rendered by such equipment. These are necessary to insure a fair profit to the manufacturer, a fair profit to the railroad company and satisfaction to the patron.

The question of fuel supply is of first importance provided the equipment has been developed and will operate to the satisfaction of all concerned. What are we to do for fuel when steam locomotives for light railway service are all replaced with internal combustion driven equipment? With the steadily increasing use of internal combustion engine drives for other services will not the increasing demand for such fuel cause the price to become prohibitive? At first thought the question is more or less alarming. However, within the last few years it has been determined that, should gasoline go much above 20 cents a gallon in price, and remain more or less constant, a motor fuel equally as good if not better than gasoline can be manufactured from vegetable material. Such a motor fuel can be manufactured and marketed at a good profit at a price of approximately 20 cents a gallon. Likewise, a heavier fuel for Diesel engines can be produced at a price not in excess of the price now in effect.

Two Types of Motor Units Proposed

The ultimate design of internal combustion equipment to meet the requirements of the service has not yet been established and in arriving at the nature of the design in general, it is necessary to consider economical production. Not more than two different power units with possible variations of control equipment should be used in order to make economical production possible and it would seem that the choosing of

these two units, such as will serve all requirements is of the greatest importance both to the producer, the railroads and the railroads' customers. The customers not being able to join in the development of the equipments it is left for the manufacturers and the railroads to carry it on and it will be necessary for them to co-operate in order that ultimate success may be attained.

The writer has divided the proposed classification into two units, each one forming a basis for multiple design and multiple operation. The first unit is of approximately 60-hp. capacity using a fuel known at the present time as gasoline. The second unit is of approximately 300-hp. capacity, using a fuel now known as Diesel engine oil.

It has been found that certain cylinder sizes together with certain speeds and certain types of clutches and transmissions are the most economically produced and the most economically operated, at the same time affording satisfactory service. This is especially true when used in what is known as "hard service." Col. McGrew has brought this to the fore in a most satisfactory manner in his paper.

The writer's years of experience all tend to substantiate these facts. The internal combustion engine clutch and transmission of the 60-hp. size have been developed to a highly satisfactory degree for the heaviest and hardest truck service. The intelligent mounting of this unit on a railroad car or light locomotive truck, together with a suitable and satisfactory multiple unit control, offers a successful solution of the problem for all except the heavier class of service.

The motor and transmission used in such a system can be produced economically in large quantities, not only for rail service but for other services. It can be applied to a railway truck with a slight differentiation in gears with from one to four units or motors complete per car or light locomotive, with one or more cars or light locomotives per train, scattered over an entire railroad system wherever required. The train can be controlled from either end and as each equipment is an exact duplicate of every other equipment, it is easy to instruct the operators and maintainers.

Many will no doubt say that this is entirely too radical a change but the extreme flexibility of the power truck and electro-pneumatic control of multiple unit equipment is a necessity for the lighter part of what we call classified light service. This flexibility is required not only from a transportation service standpoint but likewise for economy of production and economy of maintenance and operation.

The Diesel-Electric Locomotive

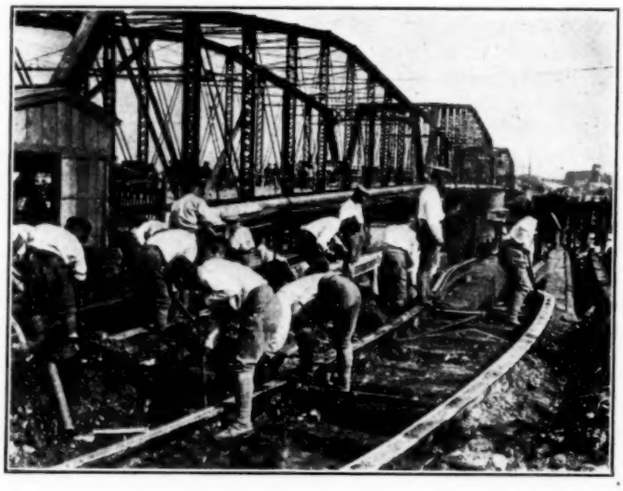
It would seem that the second unit, herein called the 300-hp. unit, can be used for the heavier part of the light service. The 300-hp. unit differs radically from the 60-hp. unit and would consist essentially of the latest type four-cycle multi-cylinder Diesel engine, with efficiently designed pistons and cylinders, the speed not to exceed approximately 650 r.p.m., with a system of fuel injection and distribution that eliminates the necessity for high pressure air piping, spray air bottles, etc. All of the latter delicate equipment should be eliminated. In other words it is possible to design an oil engine of high efficiency, light weight (approximately 60-lb. per hp.) and of a ruggedness that lends itself to very reliable service, low maintenance and easy operation—this unit being designed for constant speed and depending on the electric transmission, consisting of generator and motor, for the variable torque and speed requirements of the locomotive. By using this power system together with a proper system of control, it would be possible to build locomotives for freight, passenger or switch service on a multiple unit basis, from 300 to approximately 3,000 hp.

It will be observed that such equipment as this is primarily designed for heavier service than the 60-hp. unit, and that the 60-hp. unit is a complete unit in itself applied to a truck under a car or light locomotive except for the control. To secure additional power, additional motors are installed—either one additional motor to the same truck or to other trucks, using multiple or simultaneous control with one or more complete units under one or more locomotives or cars, which should be of strong but light construction. The 300-hp. unit is primarily for locomotive use. Flexibility as to the capacity of the locomotive is best secured by using any desired number of generators and motors in multiple in one or more locomotives.

The unit, or units where more than one is required can be installed on the underframe of the locomotive body, each engine connected to its own generator and the generators electrically connected to bus bars. Suppose for example, it was desired to use a 1,200 hp. locomotive for certain service. It would then be necessary to install four 300-hp. units in one locomotive, or two units in each of two locomotives which could be operated together by electric multiple unit control for one heavy train and separated for two light trains. The 60-hp. multiple unit system and the 300-hp. multiple unit system each lends itself to extreme flexibility of operation for switching, freight or passenger, branch line or main line service, as the case may be, in addition to which the 300-hp. multiple unit may be eventually used for quite heavy main line service.

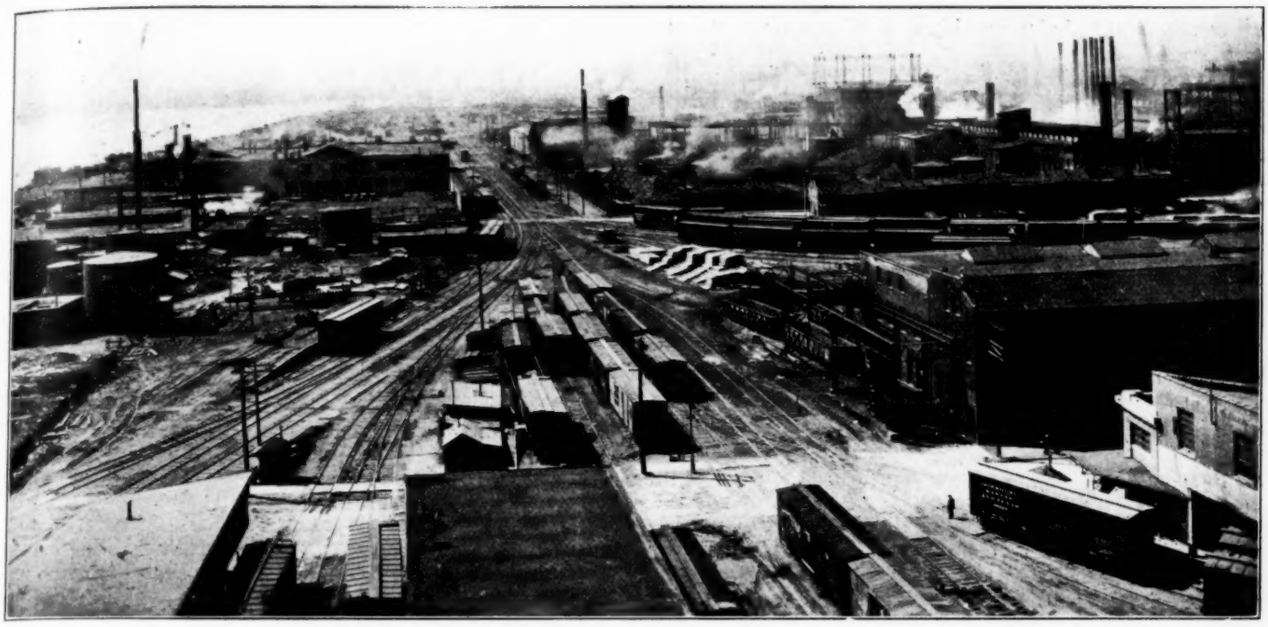
It is evident that the advantages of the multiple unit in both cases permits extreme economy in manufacture and extreme economy in operation, together with all of the advantages of extreme flexibility, and in addition permits the furnishing of a very flexible service to the patrons. The use of either of these multiple unit systems insures a maximum of dependability or reliability, as well as flexibility, and at the same time it is possible to distribute the weight of the driving wheels over a long power wheel base. Light track construction is therefore entirely satisfactory for the light branch lines, since what heavy loaded freight cars are hauled over them can be carefully hauled at slow speeds, and the passenger equipments operating at higher speeds with light wheel loads will have no bad effect.

The manufacturers developing such equipments on a multiple unit basis, whether of the light or heavy class, should be encouraged by the railroads in order that enough of these equipments be built and operated to show any weakness in design, so that they may be corrected. It is only in this way that these two classes of power for motorization can be quickly, economically and satisfactorily developed.



Keystone

Japanese Army Engineers Repairing Earthquake Damage



An Industrial Section of St. Louis Where the Trackage Problem Is Complex

Meeting the Shipper on the Industry Track*

Three Railway Officers Discuss this Problem from the Viewpoints of Different Departments

THE CONSTRUCTION of industry tracks to meet the requirements of individual shippers, their maintenance in a usable condition and the provision of adequate switching service over them, are three problems, the proper solution of which will do much to promote proper relations between the railroads and the industries they serve. In years gone by the competition between the railroads frequently led them to construct and maintain many industry tracks under arrangements that were highly adverse to the roads. This has now been largely overcome through the preparation of uniform contracts with the industries. However, this has not solved the problems of operation and maintenance which impose a rather severe burden on railway officers in their dealings with the industries. These problems were discussed by three railway officers who approached the subject from different angles at a recent meeting of the Maintenance of Way Club of Chicago. Abstracts of these papers appear below.

An Equitable Contract Is the First Essential

By O. F. Scudder

Land and Industrial Commissioner, Chicago, Burlington & Quincy, Chicago

The Burlington adheres strictly to the terms of General Order No. 15 and supplements thereto, covering industrial trackage, which were adopted during federal control. We do not, however, assume the cost of the turnout in advance in all cases but observe a definite policy in distributing the expense which is outlined as follows:

Where the industry to be served has a business developed to such an extent that the matter of sufficient revenue to the company is not in question, the railroad assumes the entire expense from point of switch to point of clearance, other than for special work such as drainage, street improvements, and interlocking or other electrical appliances, and owns and maintains this portion of the track. The industry is required to pay the cost of all such special work and to bear the entire cost of the balance of the track, including maintenance charges, and is given the ownership of this part of the track.

Where there is a question regarding the amount of revenue the company can expect from the industry seeking a track, a payment in advance is required from the industry covering the full cost of the track, with provision for a refund at the rate of $2 per car for each car load shipped to or from the industry having a net road haul revenue of not less than $25 during a period of three years, covering that portion of the cost of the track between the point of switch and the point of clearance, other than for special work. The railroad retains ownership of the track from point of switch to point of clearance and maintains it, the balance of the track being owned and maintained by the industry. In the event that the shipments handled on any such track are not of sufficient volume to equal the amount subject to refund within the period mentioned, the balance of the cost is borne

*Abstracts of three papers presented before the Maintenance of Way Club of Chicago, on December 12, 1923.

permanently by the industry without further recourse upon the railroad.

In fixing the division of ownership of the track we make exception to the rule outlined above in cases where industrial trackage leads from non-operating tracks; that is, an extension to an existing industrial track or an additional track leading therefrom. In this class of contracts the industry is required to bear the cost of the entire track, together with all maintenance costs and will have the ownership of it. Our operating contract provides that the company shall have exclusive control of the operation of that portion of any track between point of switch and point of clearance.

For the past year or so during the extreme shortage of labor, we have required the industry to do the grading and also to provide all other labor necessary in the construction of the track, the company furnishing the supervision and the use of tools. The industry is required to pay the wages of the foreman during the time he is occupied in supervising construction, while charges for the use of tools are absorbed in our percentages applied to the cost of the material.

The policy outlined above covers all new industrial trackage with the exception of temporary trackage installed for the use of contractors. In the installation of tracks of this nature the industry does the grading, furnishes the labor and bears the entire expense of all material furnished by the railroad company, with the exception of rail, the rail being furnished by the railroad to the contractor on an interest rental basis of 12 per cent per annum, 6 per cent to cover depreciation and 6 per cent to cover rental. Our contract provides that upon the completion of the work, if the owner of the track material (other than rail) desires to dispose of it, we have the privilege of repurchasing such material subject to the following depreciation percentages:

	Per cent per annum
Bolts, nutlocks and spikes	50
Tie plates, rail anchors, rail braces, guard rails and fastenings and angle bars	15
Ties	25
Frogs, switches and stands	20

In contracts of this nature the contractor also bears the cost of track maintenance, the railroad company reserving absolute control of operation between point of switch and point of clearance.

In arranging for supplemental contracts where the interests of an industry have been taken over by another and the nature of the business is not changed, we generally extend the terms of the existing contract, even though the maintenance charges are imposed on the railroad, as we deem it good policy to respect our existing contracts. In instances, however, where the trackage has previously been under contract to an industry and such industry discontinues the use of the track and the track is subsequently used to serve an industry locating thereon whose interests are entirely independent of the interests of the industry referred to in the original contract, we do not apply the terms of the original contract to the new industry unless they conform to our present rules, but prepare an entirely new operating contract under which the industry is required to bear the maintenance costs.

I think the most difficulty in the maintenance of industry tracks is encountered with tracks not under contract, and which serve more than one industry. We are endeavoring as far as possible to get all industrial tracks under contract so as to overcome the frequent disputes that arise over any question of expense involved in the operation of the tracks, even though in some instances we are obliged to assume the cost of maintenance. It is of great advantage to the railroad officers responsible for the upkeep of tracks to have this record. There are many tracks, of course, in all of the densely built up industrial districts, which are subjected to joint use in so involved a way that the securing of any contract is impracticable. This situation is likely to remain with the railroads.

In Chicago we have adopted the rule that before repair work of any character is done on any industrial track, the matter is taken up with the office of our terminal superintendent. If it develops that the track in question is not under a contract which prescribes the terms as to maintenance, the question is taken up with the industry and an agreement reached regarding the expense before work is authorized. We have found this works greatly to our advantage in savings on maintenance charges, as it has been possible to get a large majority of the industries to assume these costs. We have close to 400 industries on our tracks in Chicago and if this matter were not watched closely we would be burdened with a heavy expense for track repairs. In cases where two or more industries are served by the same track we make an adjustment of maintenance costs between them on the basis of usage, which is uniformly satisfactory.

During the past year we put more than 100 tracks of different classes under contract and in every instance the maintenance cost has been placed on the industry. It is now generally recognized by the industries that the tracks upon which they receive and ship freight are as much a plant utility as any other facility employed in the business, and in very few instances are any exceptions taken to the terms imposed as to maintenance or other charges.

From the Operating Officer's Standpoint

By Colonel C. L. Whiting
Superintendent of Terminals, Chicago, Milwaukee & St. Paul, Chicago

All industries should be made to realize the necessity of having their plans reviewed by the railroads in so far as the lay-out of the tracks that they expect to install is concerned, before construction is started. Many cases have come to my attention where buildings have been erected about which it was impossible to construct tracks suitable for efficient operation.

Often the owner does not realize that it is to his benefit, as well as our own, to have the curvature and grades as light as possible. Where possible in new industrial districts, the curvature of industry tracks should not be more than 20 deg. In old and established districts where many tracks have curvature as high as 40 deg., each case should be considered on its merits. We try, from time to time, to cut the curvature down so that these cases of extreme curvature will eventually be eliminated.

The matter of clearances should also be given careful consideration. The various regulatory commissions have imposed rules and regulations covering these matters and steps should be taken to see these are complied with in the layout before the industry starts construction.

Agreements should be carefully drawn so that as time goes on and property changes hands and railroad officers are also changed, there will be no question as to the meaning of the terms of the contracts. This will enable the railroad to make out just bills which the industry can pay without question. At present too many disputes arise because of obscure or incomplete agreements.

While it is not necessary that the matter of switching be covered in the original agreement, there should be an understanding with all industries as to the time that their switches are to be made, and the railroads should endeavor to give this service just as regularly as they operate their passenger trains. I believe this can be done if we have the right kind of an organization.

Too many of our industries build just enough tracks to allow them to unload one or two cars at a time, when they know from the start that they will handle a great many more cars at times and assume that they can depend on using the railroad's yard tracks for the storage of their cars. This means that the switching and storage tracks in busy industrial districts are often badly congested with cars awaiting delivery to industries.

There are many cases where an industry track of 10 car lengths has twice as many industries located on it, each of them getting two and three cars a day. This delays the unloading of equipment as well as the switching for other industries and team tracks that are in shape to handle all the cars we can get to them. It is also important that industries have enough track room to hold their cars, not only until they are loaded but until they are properly billed.

It may also be said that many warehouse concerns promise their tenants railway service which is not warranted by their track facilities, giving them to understand that they will get 100 per cent switching service from the railroad, although this is absolutely impossible. There is a limit to the number of shippers that can be served on a given track space. This is a matter which the industry and the operating and traffic departments of the railroad should consider before agreements are made, so that these warehouse concerns will confine their operations to a reasonable relationship with their track facilities.

Until the public in general can be made to understand that the dunnage should be removed from every car that is unloaded, whether on industry tracks or team tracks, it is going to be very hard for the railroad to place clean cars for loading. At the present time few concerns clean the cars out as they should. Many industries make it a practice to clean the cars out on the track where they are loaded. This results in dangerous conditions, especially on industry tracks in alleys and other points of limited room. In many instances concerns do co-operate with the railroad in keeping their tracks clean, but they are primarily the large shippers, probably because they have larger organizations and appreciate what this means to the operation of the tracks.

For the last few years we have had much trouble with the shippers of sand and gravel because they will not keep their materials back the required distance, with the result that derailments and personal injuries have occurred. More recently they have begun to realize the necessity for precautions in this regard and are building permanent bulkheads to eliminate this trouble. Lately I have noted a greater degree of co-operation between the railroads and the industries. This leads me to believe that both the railroads and the shippers have begun to realize that neither can operate successfully without co-operation.

The Industry Track from the Maintenance Standpoint

By E. D. Swift

Engineer Maintenance of Way, Belt Railway of Chicago, Chicago

Lack of familiarity with the maintenance of private tracks might well result in the opinion that little difficulty should be experienced in maintaining them, for it is plain that these tracks are not unusual in their character and that they do not comprise an unusual proportion of the tracks maintained by a railroad in a given section or other maintenance unit. But notwithstanding this, it is the common experience that the diversion of labor to such tracks, at least in so far as heavy industrial districts are concerned, at times creates a real handicap to the track supervisory organizations in the performance of more definitely assigned responsibilities. Granted that the tracks, as such, do not offer burdensome conditions where should we look for the trouble?

Answering the question, the writer suggests that investigation of surrounding influences will probably show that practically all work of this kind which bears on the progress of other work comes up for performance at times when business is heavy and when the railroad has more work to do on its own property than it can find labor to do with. Obviously the opportune time for overhauling industry tracks is during periods of business depression. But at such times the industrial companies are naturally not enthusiastic about making deferable expenditures unless there is some good reason for so doing and if they are not approached by the railroad with a suggestion as to the wisdom of having needed repairs made at that time it is natural that they should assume that deferment until more prosperous times would be in the interests of good management.

The writer is not of the opinion that the railroads have shirked responsibility in this matter, for it is recognized that the users of private tracks have in most cases the full responsibility of the maintenance of their tracks but we know from experience that practically all such tracks represent potential demand for service from the railroad company's maintenance forces and also offer the opportunity for a valuable service to its customer. Hence it would seem to be the part of wisdom for the railroad to keep advised of the condition of private tracks so that it may make intelligent and timely recommendations of the need for repairs as these develop. If the work is to be done by the carriers it should be planned so that it may be performed at times when it will interfere least with company work. Failure to handle the situation along some such lines is reasonably sure to create a demand for attention when labor and probably materials can only be spared from company work at a sacrifice.

A phase of private track maintenance which requires a different approach from the occasional overhauling that is demanded by gradual deterioration, is the emergency call resulting from a sudden failure of the track in some particular which may put it partially or wholly out of commission. This matter of maintenance is more or less formally negotiated; the common custom of the railroads being to require written authority for the expense or a cash deposit before any work is done. But when dealing with emergencies such methods contain possibilities of costly delays and it would seem that, when relatively small repairs are sufficient to restore service and when the industry has a management of good repute, the local railroad representative, even though of no higher rank than a section foreman, should have the option of negotiating informal authority with the local representative of the industry, so that the work may proceed. The interests of both parties seem too important to justify a stand on technicalities in such cases.

Before the war it was the common custom for railroads to perform practically all of the maintenance of tracks for the industries but the great demand for such work that developed during and immediately after the war, coupled with the coincident extreme labor shortage, made it quite impossible

for the railroads to comply with all requests of maintenance service. This led to the practice which has still continued in considerable measure of requiring the industries to have contracting companies do their work. The writer believes that the railroads should view with concern this loss of a means of contact between their people and the shippers and that it might be well to go to some pains to encourage the industries to call on them for service of this kind. In the light of recent developments it would appear that the railroad enterprise could ill afford to overlook this legitimate opportunity to make its services as complete and satisfactory as possible. Railroading in all its phases is our specialty and the more completely we do the job the better our reputation for competency. The maintenance of private tracks is not a direct responsibility but it is an opportunity for making our service more complete.

Effort to Take Labor Bill from Committee

WASHINGTON, D. C.

A MOVE to discharge the House committee on interstate and foreign commerce from consideration of the Howell-Barkley bill, drafted by the railroad labor unions, which would abolish the Railroad Labor Board and set up boards of adjustment and a new board of mediation and conciliation in its place, was started in the House on April 15 by Representative Barkley, who charged that the committee had refused to grant hearings on the bill. Under the new rules adopted recently by the House at the instance of the "progressives," he filed a motion that the committee be discharged. To make this motion effective, under the rules, it must be signed by 150 members of the House. Mr. Barkley spoke for an hour on the history of railroad labor legislation and on the provisions of the bill, using very largely material included in a pamphlet published by the labor organizations. He said in part:

"This bill was introduced in the House on the 28th day of February. It is the result of nearly two years of serious thought and collaboration among those who propose it. It was introduced in the Senate on the same day by the Senator from Nebraska [Mr. Howell]. It was introduced in the Senate by a republican and in the House by a democrat in order that it might not be looked upon in any sense of the word as a partisan measure. I am a member of the Committee on Interstate and Foreign Commerce, to which this bill was referred. I have made numerous efforts to secure its consideration in the committee. Those who are backing this bill have made a request for hearings on it, but up to this time the committee has taken no action on it. They have refused to grant hearings upon it; they have even refused to grant the proponents of this measure one day in which they might make a statement to the committee with reference to the provisions of this bill, although the Senate Committee on Interstate Commerce has granted the proponents and the opponents of this bill a hearing and the hearings have been completed on both sides, and the bill is now under consideration by a sub-committee appointed by the Senate Committee on Interstate Commerce. I am unable to understand why the United States Senate, with all of its business and with the charges that have been flung at it to the effect that it is not transacting the public business because investigations are interfering, has been able to grant the workers of the United States a hearing on an important measure, while the House of Representatives has thus far, through its committee, refused to give any consideration to this measure.

"I do not know whether we shall be able to secure consideration of this bill in the committee or not. If I were permitted to make a venture, I would hazard the guess that that committee will not consider it during this session; it will not consider it during this Congress; it will not grant any hearings to either side during this Congress; and if the bill is considered by the House of Representatives it will have to be considered under the rule which was adopted at the beginning of this session permitting the members of this House to discharge a committee from the consideration of a bill after it has been in that committee for more than 30 days."

Alfred P. Thom, general counsel for the Association of Railway Executives, has filed with the Senate Committee on Interstate Commerce, which recently held hearings on the Howell bill, a statement replying in detail to the charges made by Donald R. Richberg, counsel for the labor organizations who proposed the bill, in his reply to the testimony of the railroad witnesses. In conclusion the statement said:

"The present law should be left unchanged. The question is not one in which the carriers and their employees alone are interested. It is one in which the public, which in the last analysis pays the bill, is equally interested, and the present law, providing for the protection of that interested party and throwing safeguards about the interests both of employer and employee, is wise legislation, which should be permitted to remain. The Labor Board has justified its creation and its existence and the principle upon which it rests, through four years of trial and the most trying years through which the country has passed. The creation of national boards of adjustment is an adoption of a principle which was in effect during the federal control of railroads but which did not operate well even when the railroads were under a unified control. The creation of a board of mediation and conciliation and the provisions for arbitration in the pending bill are an application of principles which have heretofore been enacted into law and which have been found to be failures. We have, therefore, concretely, a proposal to substitute for a system of law which has worked well and is working well, a system founded upon principles which in practice have been proved to be unsuccessful. To such a proposal we are unalterably opposed."

Decision in Los Angeles Union Station Case

WASHINGTON, D. C.

THE DECISION of the Supreme Court of the United States that the Railroad Commission of California has no power to order the Atchison, Topeka & Santa Fe, the Southern Pacific and the Los Angeles & Salt Lake to build a new union station in Los Angeles and extend their main tracks thereto in connection with the elimination of grade crossings, at a total cost estimated at from $25,000,000 to $45,000,000, was briefly reported in last week's issue of the *Railway Age*. The court held that the course since taken by the city of Los Angeles, in applying to the Interstate Commerce Commission for an order requiring the construction of the union station, is the correct one and that until the commission shall have acted the roads cannot be required by state authority to provide a new interstate union station. The text of the court's opinion, by Chief Justice Taft, in which the law points are discussed is in part as follows:

On the one hand it is urged that with the purposes thus declared the act commits to the supervision and control of the Interstate Commerce Commission such an undertaking as is here in question involving a new capital investment of from twenty-five to forty-five millions of dollars in the terminals of three great interstate railway systems in the largest city of our western coast. On the other hand, it is earnestly contended that since no specific provision

is made for the supervision of interstate union stations, by the Interstate Commerce Commission, the whole subject remains in the control of the state railroad commissions. We must examine the sections of the act in some detail to determine the force of these counter contentions.

The term railroad is defined in the act, par. 3, Sect. 1, Sect. 400, to include all switches, spurs, tracks, terminals and terminal facilities of every kind used or necessary in the transportation of persons or property including freight depots, yards and grounds used therein. Section 402 after defining the term "car service" under the act, as including use, control, distribution, and exchange of locomotives, cars and other vehicles used in interstate transportation, provides for just regulation of it by the commission, and gives that body power in case of shortage of equipment or other emergency, to suspend the regulations, to give just directions, without regard to ownership, to promote the service and to adjust proper compensation for its use, and "to require such joint or common use of terminals including main track or tracks for a reasonable distance outside of such terminals, as in the opinion of the commission will meet the emergency and the public interest and upon hearing determine just compensation for use of same." Paragraph 16 authorizes the commission to provide transportation by other carriers if one carrier is unable to handle its traffic upon terms fixed by the commission.

By Section 405, amended section 3 of the interstate commerce act provides in its third paragraph that all carriers shall afford all reasonable facilities for the interchange of traffic between their respective lines and for forwarding and delivering passengers. Paragraph 4 provides that the commission may in the public interest and without impairment of a carrier's power to handle its own business with its terminal facilities, require the use of its terminal facilities, including its main line track or tracks for a reasonable distance outside of its terminal for another carrier or carriers, upon such terms as may be agreed upon by the parties, fixed by the commission or determined by suit as in condemnation proceedings.

It is obvious from the foregoing that Congress intended to place under the superintending and fostering direction of the Interstate Commerce Commission all increased facilities in the matter of distribution of cars and equipment and in joint terminals, in the exchange of interstate traffic and passengers between railways so as to make it prompt and continuous. It not only provides for the temporary expropriation of terminals and main track of one railway to the common use of one or more other railways in an emergency but it also contemplates the compulsory sharing of one company's terminals with one or more companies as a permanent arrangement. This is a drastic limitation of a carrier's control and use of its own property in order to secure convenience and dispatch for the whole shipping and travelling public in interstate commerce. It gives to the Interstate Commerce Commission the power and duty where the public interest requires, to make out of what is the passenger and freight station of one interstate carrier, a union station or depot.

But it is insisted that the supervisory power thus conferred does not include the installation of an interstate union station, where its terminals and main tracks are newly built, and the interstate carriers are compelled to expropriate, not the terminal property of another interstate carrier, but property of others than carriers not theretofore used for terminals. This would be giving power to the Interstate Commerce Commission to provide for a small and contracted union station of interstate carriers limited to the terminals of one carrier, and would leave the larger and more important union stations of interstate carriers to the control of state commissions. We think, however, that means of control over installation of such new union stations for interstate carriers is given to the Interstate Commerce Commission in amended paragraphs (18-21) of section 402. They provide that no interstate carrier shall undertake the extension of its line of railroad or the construction of a new line of railroad, or shall acquire or operate any line of railroad, or extension thereof, or shall engage in transportation over such additional or extended line of railroad unless and until the commission shall certify that public convenience present or future requires it, and that no carrier shall abandon all or any portion of its line or the operation of it without a similar certificate of approval. Such a certificate is, we think, necessary in the construction of a new interstate union station which involves a substantial and expensive extension of the main tracks or lines of interstate carriers who theretofore have maintained separate terminals.

It is argued that paragraphs 18 to 21, of section 402, refer only to extensions of a line of railroad having the purpose to include new territory to be served by the interstate carrier and do not refer to an extension of new main track for the mere purpose of rearranging terminals within the same city. We do not think the language of paragraphs 18 to 21 can be properly so limited. We are confirmed in this by paragraph number twenty-two which immediately follows:

> "The authority of the commission conferred by paragraphs (18) to (21), both inclusive, shall not extend to the construction or abandonment of spur, industrial, team, switching or side tracks, located or to be located wholly within one state, or of street, suburban, or interurban electric railways which are not operated as a part or parts of a general steam railroad system of transportation."

This is a palpable distinction between the main tracks of an interstate carrier, and its spur, industrial, switching or side tracks, and shows the legislative intention to retain any substantial change in the main tracks within the control of the Interstate Commerce Commission. It may well be that a mere relocation of a main track of an interstate carrier which does not involve a real addition to, or abandonment of, main tracks and terminals, or a substantial change in destination, does not come within the paragraphs 18 to 21. One might, too, readily conceive of railroad crossings or connections of interstate carriers in which the exercise by a state commission of the power to direct the construction of merely local union stations or terminals without extensions of main tracks and substantial capital outlay should be regarded as an ordinary exercise of the police power of the state for the public convenience and would not trench upon the power and supervision of the Interstate Commerce Commission in securing proper regulation of an interchange of interstate traffic or passengers. Only a lawful order of the Interstate Commerce Commission would raise a question of the power of a state commission in such cases as the proviso of paragraph 17, section 402 of the transportation act shows:

> "That nothing in this act shall impair or affect the right of a state in the exercise of its police power, to require just and reasonable freight and passenger service for intrastate business, except insofar as such requirement is inconsistent with any lawful order of the commission made under the provisions of this act."

But there is a great difference between such relocation of tracks or local union stations and what is proposed here. The differences are more than that of mere degree, they and their consequences are so marked as to constitute a change in kind. They come within paragraphs 18 to 21 of section 402 and require a certificate of the Interstate Commerce Commission as a condition precedent to the validity of any action by the carriers or of any order by the state commission.

The proviso of paragraph 21 of section 402 is significant of the distinction we are pointing out. It forbids the commission to authorize or order the extension of its lines "unless the commission finds, as to such extension, that it is reasonably required in the interest of public convenience and necessity, or as to such extension . . . that the expense involved therein will not impair the ability of the carrier to perform its duty to the public."

The extensions of the lines and main tracks of these railways under the plan which the state commission has ordered are not great in distance but they involve a new intramural destination for each railway with important changes in the handling of interstate traffic and passengers. Great expense attends such changes.

The purpose of Congress to prevent interstate carriers from incurring expense which will lessen their ability to perform well their interstate functions is further shown in section 439 of the transportation act, whereby the Interstate Commerce Act is amended by insertion of section 20a. This new section subjects to the approval or rejection of the Interstate Commerce Commission the issue by an interstate carrier of all future shares of stock, bonds or other evidence of indebtedness and forbids approval unless the commission shall find that their issue is for a lawful purpose, is compatible with the public interest, is appropriate and necessary to the discharge of its public duty as a common carrier and will not impair its ability to perform that service. This is of course *in pari materia* with the restriction of paragraph 21 of section 402 to prevent a possible impairment of the financial ability of interstate carriers to discharge their interstate commerce duties. Such a heavy burden as that involved in this new union station and the main track changes and extensions and other accessories would in all probability require the three railways to issue new capital securities and this could not be done without the approval of the Interstate Commerce Commission. To be sure this provision only becomes operative when securities have to be issued and would not, of itself, prevent action by a state commission until such securities are seen to be necessary; but the provision indicates the general congressional plan.

We were advised by statements at the bar that after the California supreme court handed down its decision in this case, the city of Los Angeles filed a petition with the Interstate Commerce Commission asking for an order to provide, maintain and use a union station that a hearing followed and that, pending the decision in this court, the matter is held under consideration.

For the reasons given, we think the course taken by the city of Los Angeles was the correct one. Until the Interstate Commerce Commission shall have acted under paragraphs 18 to 21 of section 402 of the transportation act, the respondent railways can not be required to provide a new interstate union station and to extend their main tracks thereto as ordered by the state railroad commission.

Alemite Lubricating System for Rods

THE ALEMITE LUBRICATING SYSTEM, developed by the Bassick Manufacturing Company, Chicago, has recently been extended to the lubrication of locomotive rod bearings and is now being tried with considerable success on several roads. Briefly, the system consists of a large Alemite grease gun which can be quickly applied without threading over the end of a nipple the latter taking the place of the ordinary rod grease cup plug or cap. These nipples are turned into the grease cups and spot welded in place so that there is no possibility of their working out and becoming lost, a considerable item of expense in ordinary

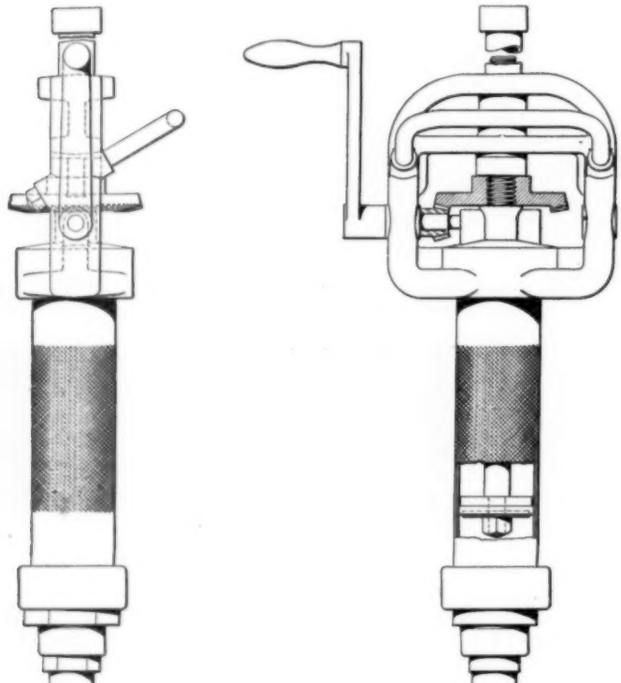


Fig. 1—The Large Alemite Grease Gun Used to Fill Rod Cups

locomotive operation due to the actual cost of the caps which work off and, perhaps more serious, the opportunity thereby afforded for dirt and grit to get into the grease. The third element of the Alemite system as applied to locomotive rods is the smaller grease gun carried by each engineman to apply grease to the rod bearings as needed while on the road.

In operation, the rod grease cups are filled at the roundhouse before starting a trip with the large gun. The arrangement of this gun to fit over the end of the nipple is apparent, as is also the powerful gearing arrangement for forcing hard grease through the ¼-in. hole into the grease cup. Pressures up to 2,500 lb. per sq. in. are said to be obtained by turning the long handle which moves the piston through a threaded spindle and gearing arrangement. Friction on the large gear is greatly reduced by means of the ball thrust bearing illustrated. The leather *L* and spring *S* in the end of the gun are so designed as to take care of slight irregularities in the nipple ends and prevent the leakage of grease when the gun is first applied. After pressure is developed in the gun, the leather is held against the nipple with a heavy pressure and no grease can be forced out except to the grease cup.

Referring to the illustration of the nipple, *A* is the shoulder over which the grease gun fitting is applied. The valve *B* and spring *S* are so arranged that hard grease can enter the nipple, but as soon as the pressure is relieved the valve

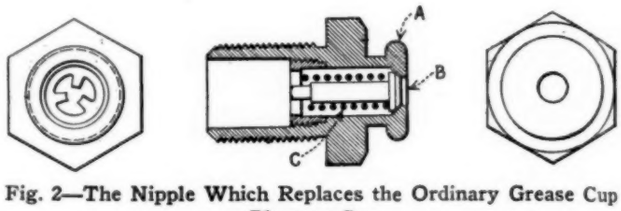


Fig. 2—The Nipple Which Replaces the Ordinary Grease Cup Plug or Cap

seats and prevents the entrance of dirt or other foreign matter.

Probably the main advantage of the Alemite lubricating system as applied to locomotive rods is in the better lubrication provided. With reasonable care in filling the gun, clean grease can be applied to the rod bearings with no danger of cinders, dust and dirt being included as is too often the case under present methods. Enginehouse men assigned to the duty of filling rod grease cups do not always realize the importance of keeping the grease clean and even with the best of intentions under present methods the cylindrical sticks of grease often contain more or less dirt picked up when they are laid on the rods or possibly fall to the ground. The Alemite System is designed to prevent foreign matter getting into the grease and eventually to the rod bearings in this

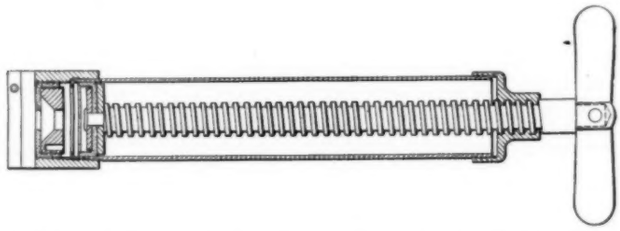


Fig. 3—The Small Grease Gun Which Is Carried by the Engineman

manner and hence tends to improve the efficiency of rod lubrication and prevent cut and hot bearings.

The prevention of lost grease cup plugs and caps is an important advantage as is also the considerable saving in time effected by the Alemite system both in filling grease cups at the enginehouse and in applying grease to the bearings as needed on the road. The grease gun fitting is simply applied over the end of the nipple and a few turns of the handle will do the work whereas the older method requires that the plug or cap be threaded into and out of the grease cup possibly several times before sufficient grease can be forced in to fill the cup.

An important safety feature of the Alemite system results from the fact that should a rod bearing become hot, grease can still be forced into it with the grease gun without danger of the engineman being scalded with boiling grease. Serious burns sometimes result when enginemen apply grease to a hot bearing and attempt to thread the plug or cap back into the cup by hand.

Railroad Traffic and the Business Cycle

Third Article in Series Shows How Individual Carrier Is Assisted in Forecasting Tonnage Volume

By Homer B. Vanderblue

Professor of Business Economics, Harvard University; Economist, Harvard University Committee on Economic Research

PART III.—THE TRAFFIC OF AN INDIVIDUAL CARRIER: THE SOUTHERN RAILWAY[1]

PREVIOUS INSTALLMENTS of this discussion have indicated the close relationship of railroad traffic in the United States, whether measured by total net ton-miles or by carloadings, to the course of general business as recorded by the business curve (B) of the Harvard Economic Service. The general conclusion was drawn from this discussion that in the years 1903-14, and again in 1919-1923, a forecast of the probable course of Curve B would have served also as a forecast of the cyclical changes in the total volume of railroad traffic. In other words, railroad traffic responds to the same cyclical influences as does general business; when business is depressed, railroad traffic tends to decline; when business is prosperous, railroad traffic tends to expand. This close relationship of traffic to general prosperity arises because of the character of the service that the railroad performs in our economic organization.[2]

It has been previously recognized, furthermore, that the individual railroad executive, desiring to utilize an analysis of the cyclical variations of traffic or expense in formulating a judgment on matters of operating or financial policy, would find it necessary to make a detailed analysis of the statistics showing conditions on his own road. He is concerned with conditions on a particular system, where the statistics might well show considerable variance with any composite picture presented for all railroads, either as regards growth, seasonal variation, or the extent of response to general business conditions in the country as a whole, for which Curve B gives a picture. The present discussion therefore considers the suggestion presented at the conclusion of Part I, that correction of a series of monthly data for an individual railroad, in order to remove both trend and seasonal variation, would indicate the character of the response of the traffic carried by that road to the influence of the business cycle.[3] The series here used for illustrative purposes is that for the total tons of revenue freight carried by the Southern Railway. Annual figures since 1894 and monthly figures since 1910 have been analyzed.

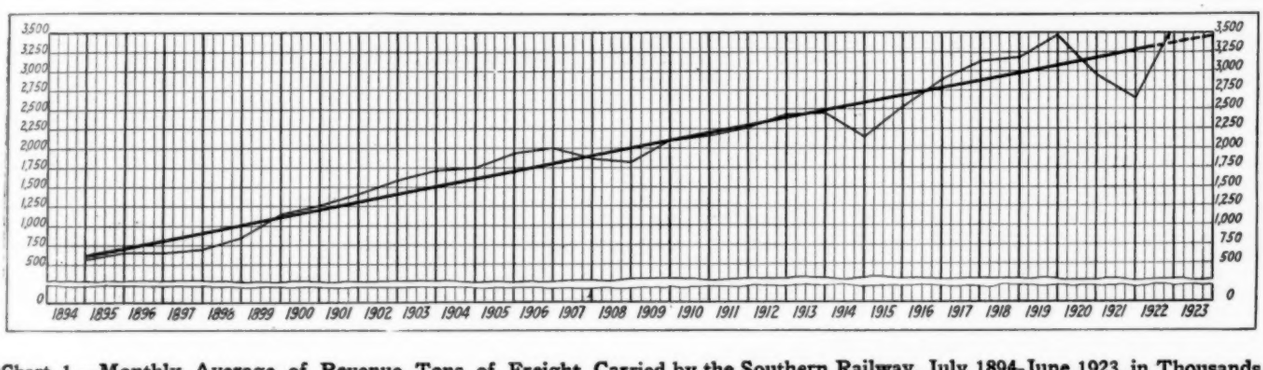


Chart 1.—Monthly Average of Revenue Tons of Freight Carried by the Southern Railway, July 1894-June 1923, in Thousands of Tons, and Line of Long-Time Movement or Secular Trend. The Monthly Average Plotted as of January 1 is for the Twelve Months Period Ending June 30. For the Twelve Months, July 1922-June 1923 Inclusive, the Monthly Average is 3,583 Thousand Tons.

Correction for Trend

The annual figures were used only in the calculation of secular trend or normal long-time growth, a monthly average being calculated for each twelve months' period ending June 30, the date when, until 1916, the fiscal year ended.

The history of the Southern Railway began with the completion of the reorganization of the system in 1894. Chart 1, therefore, shows the line of "long-time movement" or normal growth in the volume of revenue tonnage (not ton-miles) handled by the Southern Railway during the years 1894-1923. The steady growth in the volume of traffic during this thirty-year period reflects the steady expansion of business in the South and the generous sharing in that growth by the Southern Railway.

Chart 1 also indicates, in a general way, the periods of business depression and prosperity. Whenever the curve for tonnage moved rises above the line of trend, an active condition of business is reflected; whereas, when it falls below the line of trend, business depression is reflected. Thus the depression of the middle nineties and the expansion at the end of the last century is clearly indicated; also the prosperity of the years 1900-1903. The slowing down

[1] The statistical analysis here discussed was made by one of my students, W. W. Zachary, a member of the second year class of the Harvard Business School, as a part of his work in the course in Advanced Business Statistics directed by Professor A. J. Hettinger, Jr. In general, Mr. Zachary used the methods developed by Professor Warren M. Persons of the Harvard University Committee on Economic Research, and utilized by that committee in its publications, the *Weekly Letters* of the Harvard Economic Service and the *Review of Economic Statistics*. In the early numbers of that Review, Professor Persons explained his statistical work in detail, and his discussion is available in reprinted form: *Indices of General Business Conditions*, published by the Harvard Committee. This is invaluable as an exposition of statistical methods. I am indebted to the Harvard University Committee on Economic Research for permission to reproduce the business curve (B) in Charts 6 and 7 and much of the material presented in Parts I and II of this discussion. C. A. E. McCarthy, secretary of the Southern Railway furnished the data for the years 1894-1922.

[2] Part I of this series of articles appeared in the *Railway Age* of March 22, page 783; Part II in the issue of April 5, page 885.

[3] *Railway Age* of March 22, page 783.

in 1904 was followed by the climb to the boom prosperity of 1906-07, and the depression of 1908-09 by the moderate recovery to comparative prosperity in the years 1909-13. The depression at the beginning of the war was followed, in turn, by the war-time expansion, then by the severe depression of 1921, and, finally, by recovery and prosperity in 1922-23. But the picture presented on Chart 1, while indicating the traffic growth of the Southern Railway and the influence of the business cycle on that growth, is hardly useful (except in a very general way) for comparison with either the Harvard business curve (B) or the index of total railroad traffic based on net ton-miles presented in Part I of this discussion. An analysis of monthly data is necessary before any really significant comparisons can be made. Such analysis and comparisons are presented in Charts 2 to 7.

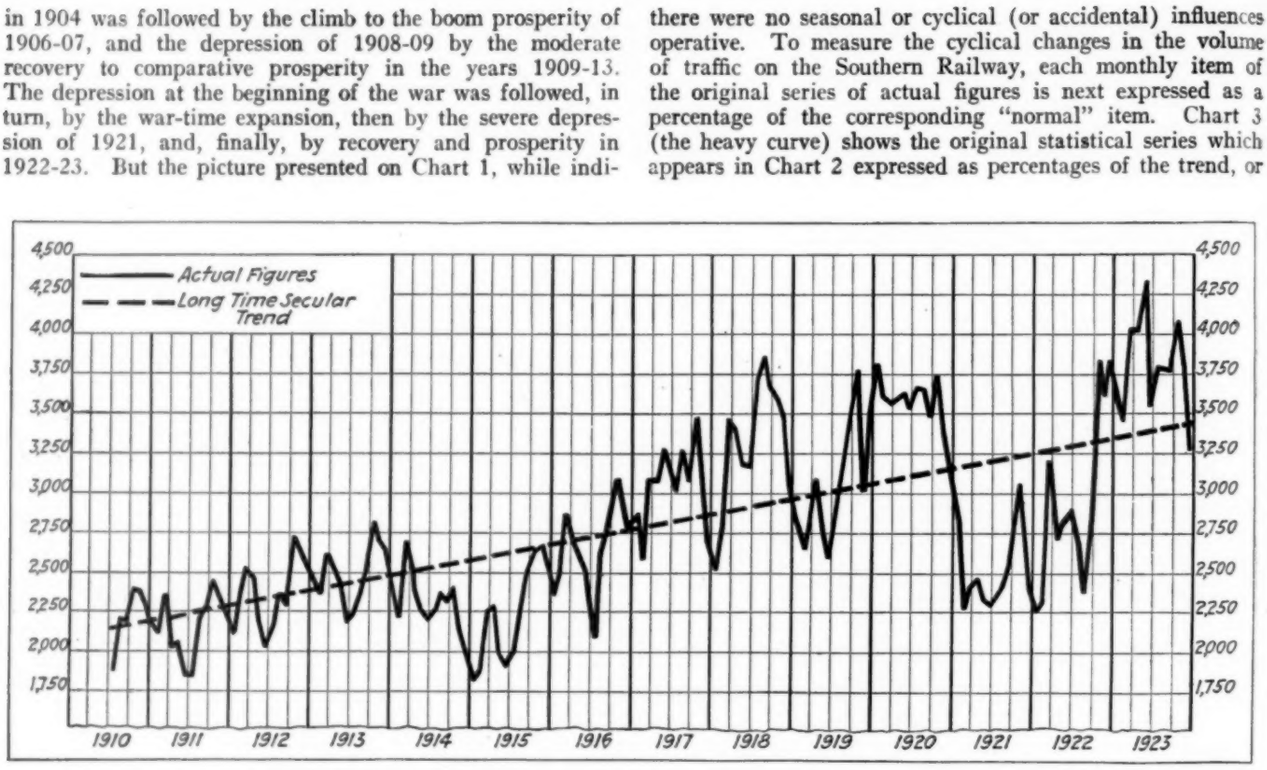


Chart 2.—Revenue Tons of Freight Carried by the Southern Railway; Actual Figures (Unit: 1,000 Tons) and Line of Secular Trend

The actual monthly figures for revenue tons of freight carried since the middle of 1910 appear on Chart 2. The year-to-year growth is traced by the broken line. This is the same "long-time movement," or line of normal growth (the line of secular or long-time trend), shown on Chart 1. The position occupied by the straight line of trend measures the normal volume of traffic during a particular month if there were no seasonal or cyclical (or accidental) influences operative. To measure the cyclical changes in the volume of traffic on the Southern Railway, each monthly item of the original series of actual figures is next expressed as a percentage of the corresponding "normal" item. Chart 3 (the heavy curve) shows the original statistical series which appears in Chart 2 expressed as percentages of the trend, or after correction for long-time movement. The trend line which inclined upward in Charts 1 and 2 is shown as horizontal, and is represented as 100 per cent. Charts 2 and 3 thus correspond with Charts 2 and 3 of Part I, and the statistical analysis has been the same as explained in that connection.

Seasonal Influences

The next step is the measurement and elimination of the usual seasonal variation in the volume of freight carried by the Southern Railway. The marked seasonal fluctuation present in the series corresponds very closely in its general contour with that for total net ton-miles. From January to February of each year the movement of the heavy curve is usually downward, with a sharp upturn in March, fol-

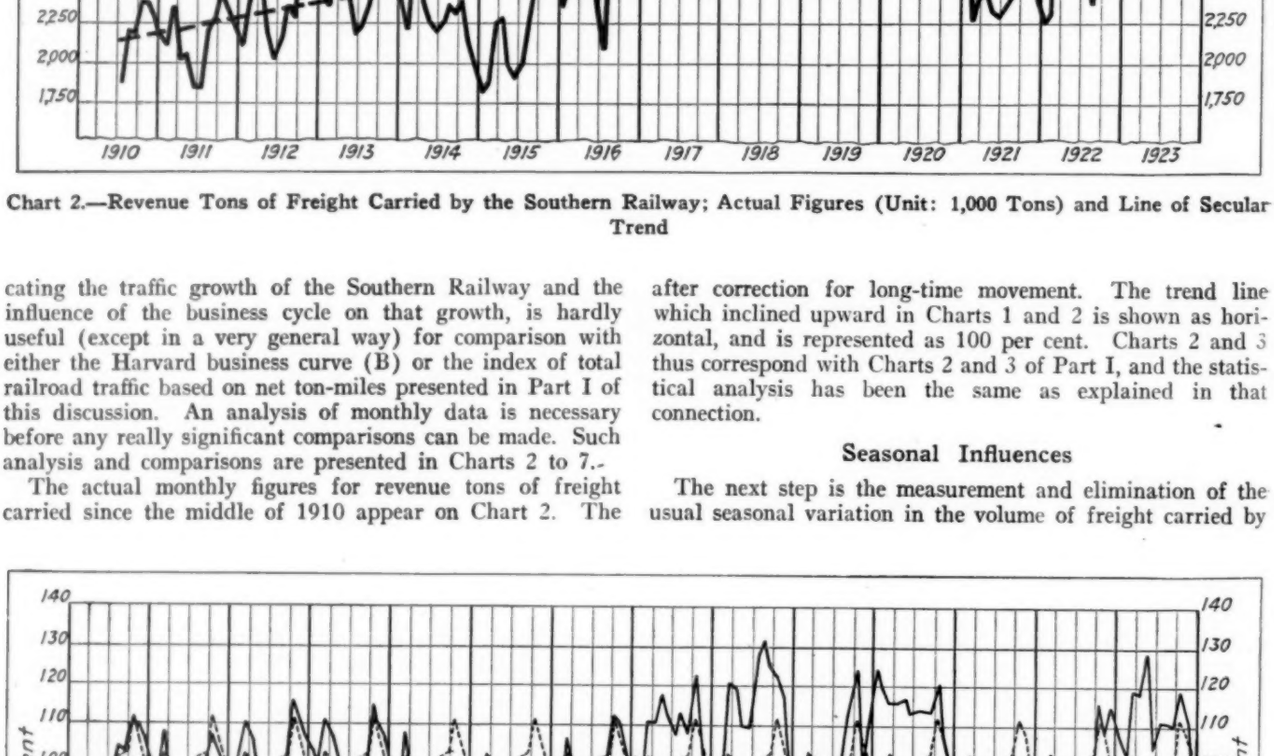


Chart 3.—Revenue Tons of Freight Carried by the Southern Railway: Figures Corrected for Long-Time Movement (Percentages). Normal Seasonal Movement Shown by Dotted Line.

lowed by a less precipitate decline in April and May.[4] From May to October, however, a seasonal expansion of traffic takes place, which is due especially to crop movements. Normally, therefore, the month-to-month movement of the Southern Railway curve is steadily upward during the autumn. But November is below October of each year, while December shows further decline. Since 1910, the curve in October has generally occupied a position higher than that of any other month in the year—the exceptions being years when business (Curve B as shown on Charts 6 and 7) was less active than in the preceding March. In the depression year, 1921, however, a sharp advance in October marked the beginning of business recovery.

In Chart 3 the light broken line traces the usual seasonal fluctuation in revenue freight, the 100 line being shown as the monthly average for the year[5]. Adjustment for seasonal influence is next to be made, in order to secure "adjusted relatives," which (since correction for both long-time movement and seasonal influence has been made) will indicate the influence of the business cycle and accidental influences such as strikes (for which no statistical allowance can be made) upon the volume of traffic carried by the Southern Railway. The 100-line represents the normal line above and below which the volume of traffic fluctuates in response to the influence of the business cycle or to accidental influences. Thus, during the years of war, non-economic influences accounted for the extraordinary stimulus to business activity and caused the volume of traffic to fluctuate[6]. Chart 4 shows the monthly adjusted relatives for total revenue tons of freight carried by the Southern Railway during the years 1910-1923. In Chart 4 trend and seasonal influences have been eliminated and the cyclical movement is disclosed in clear focus.

The depressed condition of general business during 1911 which did not show up clearly on Chart 1 is reflected on Charts 4 and 5 by the low levels of the curve for revenue freight carried by the Southern Railway in that year; the recovery in 1912 and 1913, and the subsequent decline into the depression of 1914-15, likewise appear on Chart 4. The great expansion of traffic on the Southern Railway during the war years is indicated by the high figures registered by the index during most months of 1917 and 1918. Railroad congestion accounts for the drop of the Southern Railway curve at the end of 1917 and there is further sharp decline in the early summer of 1918 when the army camps along the line of the Southern had been pretty well emptied. A sharp upturn developed in the early fall, and then followed the post-armistice depression. In 1919-20 came the boom; in the summer of 1920 occurred the crisis of that year; and then followed deep depression in 1921, recovery in 1922-23 and finally recession in the latter half of 1923. In response to the seasonal influence, however, the total volume of traffic (as traced in Chart 2) continued large during the whole of 1923.

Certain accidental or fortuitous events are also reflected clearly in the movements of the post-war curves. Strike interference with the volume of traffic carried on the Southern Railway appears in 1919, 1920 and again in 1922

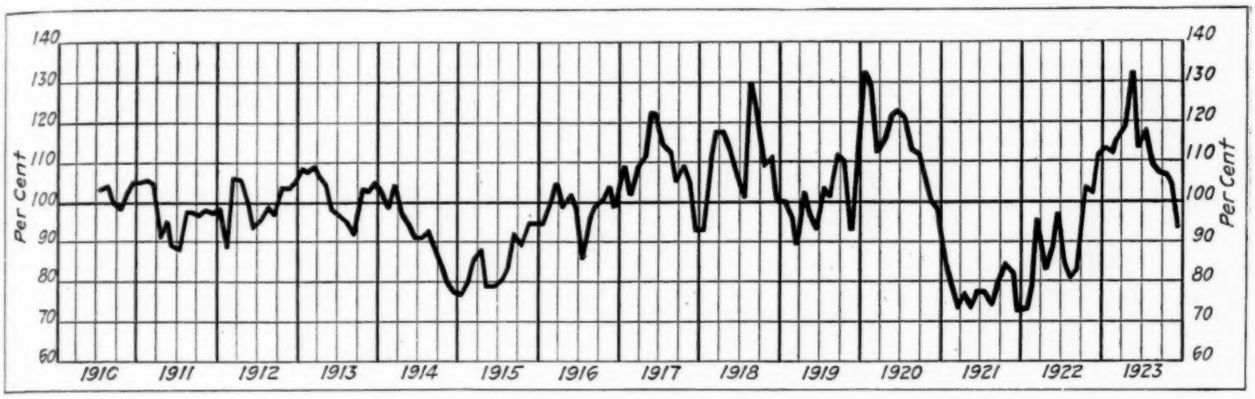


Chart 4.—Revenue Tons of Freight Carried by the Southern Railway: Figures Adjusted both for Long-Time Movement and Seasonal Variation (Percentages).

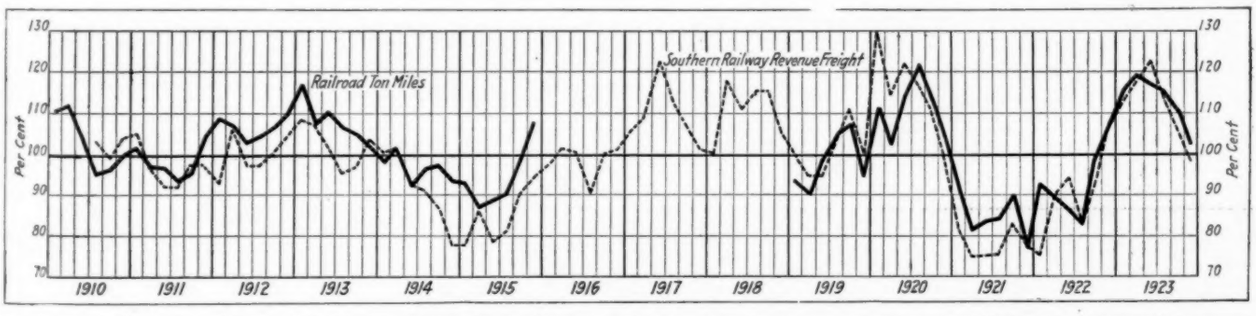


Chart 5.—Adjusted Indexes of Revenue Tons of Freight Carried by the Southern Railway and Net Ton Miles of Revenue and Non-Revenue Freight (Bi-Monthly Averages) Compared. The Adjusted Index for Revenue and Non-Revenue Ton Miles was Discussed in Part I.

[4] This movement is, of course, to be accounted for, at least partially, by the fact that February and April are relatively short months, while January and March are long months; nevertheless, the difference in length of month is not sufficient to account for all of the recurrent month-to-month change. The slowing down of business at the turn of the year was also shown in the seasonal curve for ton-miles (Chart 2 of Part I).

[5] The monthly seasonal indexes were computed by the Persons' "link-relative" method described in detail on pages 18-31 of Professor Persons' *Indices of General Business Conditions.*

[6] In this case the correction for seasonal influence was made by a division process rather than by the subtraction process explained in Part I.

when the Southern curve dips sharply for several months. Thus the adverse effects of the coal and steel strikes in October—November, 1919, those of the "outlaw" railroad strike in April, 1920, and finally the effects of the coal miners' and shopmen's strikes in the summer of 1922 are shown by the temporary drop in the curve for the Southern Railway while these abnormal conditions existed. Chart 5 shows that the emergency conditions which caused the latter class of irregularities also affected the index for total railroad traffic as presented in Part I.

Comparison With Harvard Business Curve

In order to bring into clearer focus the influence of the business cycle upon the volume of the Southern Railway traffic recourse was had to the device of calculating a three

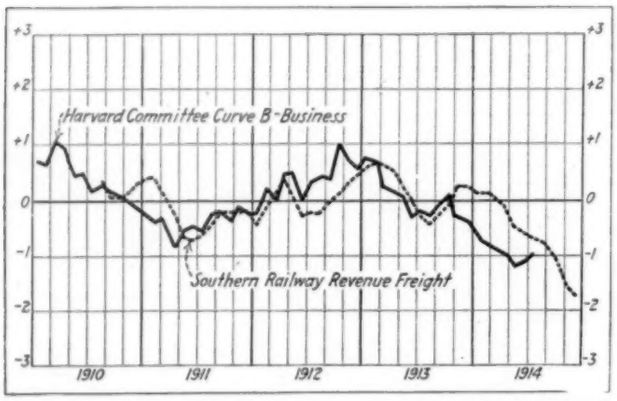


Chart 6.—Adjusted Index of Revenue Tons of Freight Carried by the Southern Railway, 1910-14, Compared with the Business Curve (B) of the Harvard Economic Service. (Unit: One Standard Deviation; Curve B Monthly, Southern Railway, Three-Months Moving Average).

months' moving average. This irons out minor irregularities in the curve; in Part I, and again in Chart 5, a bi-monthly average had been used for this purpose. But before the moving average was calculated the adjusted relatives (shown on Chart 5 with the index for total ton-miles presented in Part I) were reduced to units comparable with those of Curve B of the Harvard Index Chart. These are called cycle units[7]. The curve for the revenue tons of freight carried by the Southern Railway as measured in cycle units, (three-months moving average) and the Harvard business curve (B) are shown on Charts 6 and 7. Curve B is not available for the war years when emergency rather than economic conditions governed the volume of business. During the five pre-war years and again during

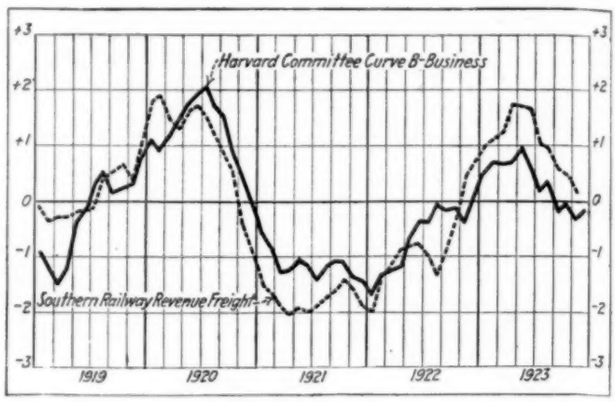
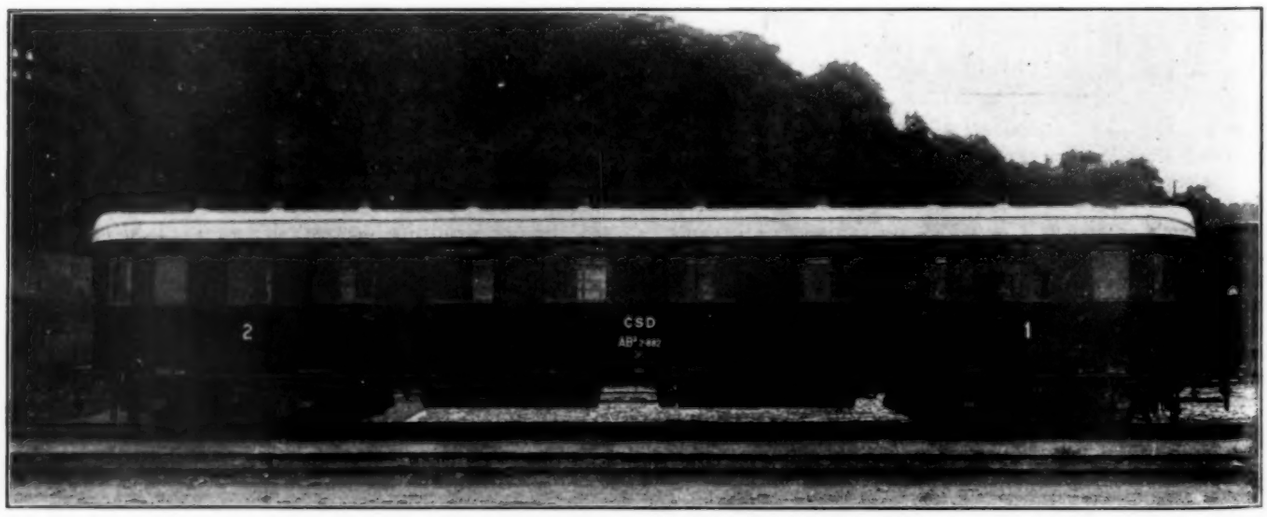


Chart 7.—Adjusted Index of Revenue Tons of Freight Carried by the Southern Railway, 1919-1923, Compared with the Business Curve (B) of the Harvard Economic Service. (Unit: One Standard Deviation; Curve B Monthly, Southern Railway, Three-Months Moving Average).

the five post-war years the curve for the total tonnage on the Southern Railway (when corrected for trend and seasonal variation) and that for general business (which is similarly corrected) coincide closely. During the years 1910-14, and again during 1919-23, a forecast of the course of Curve B of the Harvard Index Chart would have furnished help to the executive engaged in the difficult and important task of estimating the volume of tonnage which would probably be offered to the Southern Railway during the months immediately ahead.

[7] The computation of the cycle unit is as follows: Square each of the monthly percentage deviations (the amount by which the adjusted relative is more or less than 100); divide the sum of these squares by the number of months in the series, and extract the square root of this result. This figure, the standard deviation, is used as a base and each of the percentage deviations is divided by it. The resulting series of positive and negative figures, called "cycles" will be found in the case of practically all series to have an extreme range of approximately plus and minus three. See Professor Persons' *Indices of General Business Conditions* for an elaborate explanation of his methods.



New Type of Passenger Car on the Czechoslovak Railways

Union Pacific Pays Fixed Charges from Investments

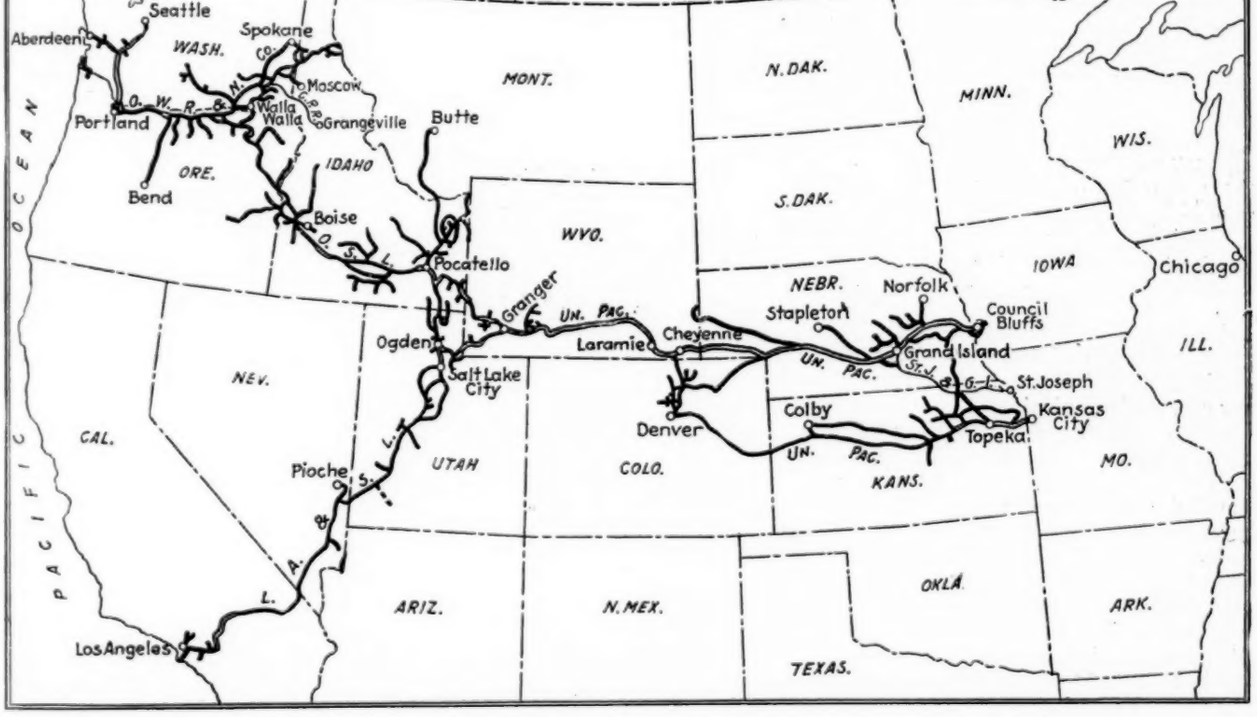
Net Operating Income of $39,922,206 in 1923 Shows 18 Per Cent Increase and Is All Available for Dividends

THE YEAR 1923, from the standpoint of corporate net income, was the best year that the Union Pacific has had since 1917. The net after fixed charges amounted to $39,922,206. The company pays 4 per cent dividends on its preferred stock, which dividends amount to $3,981,740, and 10 per cent on its common stock, which dividends total $22,229,100. The year's surplus after dividends and after certain small appropriations for sinking funds, was $13,692,569, as compared with $6,119,407 in 1922, an increase of $7,573,163 or over 100 per cent.

In 1923 as compared with 1922, the system carried 13.4 per cent more tons, 13.1 more revenue ton-miles and its total operating revenues increased 9.6 per cent. The increase in operating expenses was 5.8 per cent. In 1923 the system's net railway operating income or net after equipment and joint facility rents, was $39,660,246 as compared with $33,496,318 in 1922—an increase of 18.4 per cent.

From the standpoint of its revenues from railway operations, the Union Pacific is not yet back to a pre-war basis. The net operating income of 1923 was approximately 95 per cent of the standard return of the Union Pacific System as it existed in the test period, plus the net operating income of the Los Angeles & Salt Lake, which was taken into the Union Pacific System so that its earnings were part of the system's earnings for the first time in the year 1922.

Inasmuch as the net operating income was not equivalent to the standard return, this also means that the operating net of the system in 1923 was not sufficient to compensate for the increase in investment in the property which has taken place since the test period. Analysis of the situation develops that parts of the system have been less favored in the past two or three years than others. The Union Pacific System figures now include the operating returns of the Union Pacific itself, the Oregon Short Line, the Oregon-Washington Railroad & Navigation Company and, since 1922, the Los Angeles & Salt Lake. The Union Pacific, itself, in 1923 had a net operating income slightly greater than in 1922, and the 1923 net was equivalent to 120 per cent of the standard return. The Los Angeles & Salt Lake earned a net equivalent to about 2½ times its 1922 figure and its 1923 net operating income was equivalent to 118 per cent of its standard return.



The Union Pacific

The lines in the north, however, did not do as well. The Oregon Short Line's 1923 net operating income was slightly less than in 1922 and it was equivalent to only 59 per cent of the standard return of that property. In 1922, the Oregon-Washington Railroad & Navigation Company operated at a deficit. In 1923, it had a net, but this net was equal to only 24.4 per cent of its standard return.

One would not ordinarily expect that the Union Pacific System would be affected by the various adverse influences that have kept the northwestern roads from reporting favorable net incomes. The brief tabulation, however, shows that the Oregon Short Line and the Oregon-Washington have been affected as adversely as practically any of the roads in either the northwestern or the central western region.

There are few railroads in this country that have a more

interesting or a more romantic history than has the Union Pacific System. At the same time, there are few roads that develop more interesting and efficient methods of operation. In the case of the Union Pacific, itself, a particularly interesting development is the manner in which it moves its high grade perishable traffic which constitutes a large portion of its total business. In connection with this traffic, the Union Pacific, between Ogden and Omaha, serves as a bridge carrier and so well favored is the management that in 1923, for example, the Union Pacific itself—the operating statistics of the several Union Pacific roads are reported separately—had an average car miles per day of no less than 62.8 and net ton-miles per day of no less than 898. Further than that, the system reported an average train speed in miles per train of no less than 15.7 which was one of the highest figures reported for any road in the country. That this unusual excellence of operation is not secured by light train loading is indicated by the fact that the average net tons per train in 1923 were 640, whereas the average for the central western region was 611 and for the western district as a whole, 612. Presumably, the same efficiency of operation is shown in connection with the other branches of the system, which other portions, however, are not equally as favored from the standpoint of natural advantages and strategic location.

SELECTED STATISTICS FOR 1923

Unit	Union Pacific	Oregon Short Line	Oregon-Washington Railroad & Nav. Co.	Los Angeles & Salt Lake
Miles	3,709	2,367	2,177	1,178
Net ton miles, millions	9,010	2,917	1,753	2,381
Car miles per day	62.8	39.5	23.3	43.5
Net ton miles per car day	898	674	417	567
Train speed	15.7	13.2	10.9	12.0
Average train load	640	610	646	447
Locomotive miles per locomotive day	77.6	39.5	51.6	74.1

Diversified Traffic

Union Pacific traffic is very diversified. Of the total revenue tonnage of 1923, 30,820,137, or 28 per cent was products of agriculture, 5 per cent products of animals, 29 per cent products of mines, 17 per cent products of forests and 17 per cent products of manufacturers. In 1923, as compared with 1922, the system handled 26 per cent more products of forests and 27 per cent more manufactures, but it only handled 1.51 per cent more products of agriculture. As a matter of fact, there was a decrease of 19 per cent in wheat. It is of interest that of the total tonnage of the system no less than 5.3 per cent is in the form of sugar beets. The system probably has benefited greatly by the oil development of southern California but this is not shown in the volume of oil traffic. It is true that the tonnage on refined petroleum products in 1923 was 33 per cent greater than in 1922, but the tonnage of this commodity was only 2.81 per cent of the total tonnage handled by the system. Crude petroleum showed an increase of 26 per cent but amounted to only 1.84 per cent of the total tonnage of the system. The annual report contains the interesting information that the shipments of automobiles to the west in 1923 increased greatly, the revenue therefrom amounting to $12,500,200, an increase of $4,489,800 or 56 per cent over 1922. The average haul on traffic moved by the system in 1923 was 387 miles. It was moved at an average revenue per ton-mile of 1.285 cents, a decrease of 2.3 per cent under 1922.

Large Return from Investments

The Union Pacific System combines within itself the functions of a railroad operating property and those of an investment company. The ownership of securities of affiliated companies—excluding the securities of the four constituent companies owned within the system—is sufficient so that the return thereon covers the system's entire fixed charges. Income from investments and sources other than transportation operations in 1923 totaled $17,513,567, whereas fixed charges practically all of which were in the form of interest on funded debt, were $17,251,606, or a quarter of a million less. The result was that while the net income from transportation operations, or net operating income in 1923, totaled $39,660,246, the balance after charges was $39,922,206. This means that the Union Pacific System is in the position so that whatever net the system makes from its railroad operations is entirely available for dividends and surplus. This situation is, of course, not new in Union Pacific history. It dates back to the time of E. H. Harriman and was one of the outstanding features of his management of the Union Pacific. The return from investments in 1923 was larger than in 1922. In particular, there was an increase of $1,500,000 in dividends on stocks owned, due in part because the Union Pacific was benefited by the improved position of properties in which it had an interest and which benefit accrued to the system in the form of increased dividends.

The Union Pacific System operates a total of 9,483 miles. This mileage includes that of the Union Pacific itself, the Oregon Short Line, the Oregon-Washington Railroad & Navigation Co. and the Los Angeles & Salt Lake. It does not include the St. Joseph & Grand Island. In the annual report the operations of the first four lines are combined and offsetting accounts are excluded from the total figures. The income from the St. Joseph & Grand Island is reported in other income in the form of dividends and interest on securities owned. The control of the several properties in the system is exercised in the following form:

The Union Pacific owns all of the stock of the Oregon Short Line and half the capital stock of the Los Angeles & Salt Lake. The Oregon Short Line, in turn, owns all but $1,500 of the stock of the Oregon-Washington and the other half of the stock of the Los Angeles & Salt Lake. The total outstanding stock of the four companies amounts to $496,935,100. Of this total there are in the hands of the public only the stock of the Union Pacific itself, which amounts to $222,291,600 common and $99,543,500 preferred and the $1,500 of stock of the Oregon-Washington which the Oregon Short Line does not hold. The total funded debt of the system amounts to $549,060,595 of which there are in the hands of the public $413,586,595. The interest charges on this funded debt in the hands of the public amount to $16,879,477. It has been noted above that all of these interest charges are covered by the return on securities owned in other companies.

The Union Pacific's ownership of securities in affiliated or other companies, is made up as follows:

Stocks of affiliated companies—par value..... $34,128,503
These companies include the St. Joseph & Grand Island (the outstanding stock of which is nearly all owned by the Union Pacific), the Pacific Fruit Express, in which the Union Pacific has a half interest, various other Union Pacific properties, such as the Union Pacific Coal Co., etc., and various union terminals in which the Union Pacific has an interest such as those at Denver, Kansas City, Leavenworth, Ogden, etc.

Bonds, notes and equipment trust certificates of affiliated companies—par value..... $11,776,786

Stocks in other than affiliated companies..... $65,088,947
The companies included are the Baltimore & Ohio, the Chicago & North Western, the Chicago, Milwaukee & St. Paul, the New York Central and the Railroad Securities Company. The ownership of New York Central stock totals $21,000,000. The Union Pacific owns $22,500,000 of Illinois Central common and $4,500,000 of Illinois Central preferred, in addition to which the Railroad Securities Company, whose entire capital stock is owned

by the Union Pacific, also owns $9,200,000 Illinois Central common and $1,840,000 preferred.

Bonds, notes and equipment trust certificates owned in other than affiliated companies.... $91,858,594
These securities include a wide variety of securities of over 30 companies.

United States Government securities..... $38,309,800
These include liberty bonds and treasury certificates. At the end of 1923 the company owned $10,000,000 of these government securities more than at the end of 1922, the increase being in the form of treasury certificates of indebtedness.

In 1923, the Union Pacific System had a total return in the form of dividends on stock from its securities in affiliated or other companies of no less than $9,473,676 or $1,585,627 more than in 1922. The Pacific Fruit Express furnished a considerable share of the total return, the dividends from the Union Pacific System's half ownership in that corporation amounting, in 1923, to $4,200,000 or $3,120,000 more than in 1922. The Pacific Fruit Express has apparently been a very lucrative source of income to its two owning carriers—the Union Pacific and the Southern Pacific. The interest on bonds, notes and equipment trust certificates owned by the system in the year of 1923, amounted to $6,008,541. The total income from stocks and bonds together amounted to $15,482,217.

The situation as to the return on Union Pacific's outside investments has not been without its disappointing features. Many of the stocks which are now owned were bought at very much higher prices than those which rule today. The company has suffered because of the nonpayment of dividends by the Baltimore & Ohio for a period of several years and will accordingly benefit from the restoration of that stock to a 5 per cent basis. It will similarly benefit from the increase in the dividend on New York Central stock. The reduction in the dividend of Chicago & North Western common, of which the Union Pacific owns $4,420,600 par value, has combined to reduce the earnings from that stock and to depreciate its book value.

How a Road Can Forecast Its Tie Requirements

A Description of a Study Made by the Baltimore & Ohio to Determine Its Needs

By Earl Stimson
Chief Engineer Maintenance, Baltimore & Ohio.

FOR THE PURPOSE of estimating the required renewals of cross ties on the Baltimore & Ohio, a careful tabulation was made of all cross ties used in renewals and construction from 1901 to 1922, divided between treated and untreated ties. To this was applied the average life of treated and untreated ties respectively in the projection of the renewals required from 1915 to 1944. The average life was expressed in the number of renewals as determined by the curve developed by the Forest Products Laboratory and published in the American Wood Preservers' Association proceedings for 1918. This curve gave the relation between the per cent of renewals and the per cent of average life. It was possible to check this curve approximately by some data on experimental tests which existed on the railroad and the results were sufficiently accurate to warrant the practical application of the curve as published.

TABLE A - ESTIMATED CROSS TIE RENEWAL REQUIREMENTS OF THE BALTIMORE & OHIO for 1922 and 1923

Calendar Years	Untreated Ties Used in Maintenance and Construction	Rate of Renewals (Per cent) 1922	Rate of Renewals (Per cent) 1923	Calculated Renewals 1922	Calculated Renewals 1923
UNTREATED:					
1908	2,784,056	2		55,681	
1909	2,557,879	3	2	76,736	51,158
1910	2,186,999	6	3	131,220	65,610
1911	2,167,717	16	6	346,835	130,063
1912	2,717,320	18	16	489,118	434,771
1913	2,363,605	19	18	449,085	422,449
1914	1,653,630	19	19	314,190	314,190
1915	1,937,746	11	19	213,152	368,172
1916	1,904,593	4	11	76,184	209,505
1917	1,508,428	2	4	30,169	60,337
1918	1,086,095		2		21,722
	TOTAL UNTREATED TIES			2,182,370	2,077,977
TREATED:					
1907	0	12	12	0	0
1908	24,828	11	12	2,731	2,979
1909	88,256	10	11	8,826	9,708
1910	197,557	7	10	13,829	19,756
1911	308,097	5	7	15,405	21,567
1912	425,377	3	5	12,761	21,269
1913	399,316	2	3	7,986	11,979
1914	629,519		2		12,590
	TOTAL TREATED TIES			61,538	99,848
	GRAND TOTAL			2,243,908	2,177,825

It will be observed in the following data that an average life of 9⅓ years for untreated ties and 16 years for treated ties is used. The average life of 9⅓ years for untreated ties for the Baltimore & Ohio is definitely fixed by an analysis of the tabulation in the following tables and is supported by other investigations. It may be taken to be substantially accurate.

The average life of 16 years for treated ties is derived from our experience with such ties to date. It is based more particularly upon the results secured on an experimental section of 5,000 ties which has been under observation for 13 years. It is conservatively estimated that we will secure at least 16 years' life from the treated ties in that test which is located under conditions applying to the major part of the system.

In applying the curve of renewals, that portion of the curve representing a small percentage of the renewals at each end of the curve was grouped in the first and last years respectively so as to give renewals in sufficient quantity in those years as to be appreciable. The statement marked Table "A," showing the estimated cross tie renewal requirements for 1922 and 1923, indicates the form of this curve as shown by the rate of renewals; it also shows the method of computation by use of the curve which was common to the calculations of projected renewals for all years.

Table "B" gives the results of the study and reduces the renewals, both actual and projected, to a basis of "renewals per mile of track maintained."

The fact that the total renewals for 1923 are approximately equal to the total renewals during 1901, notwithstanding an increase in mileage from 8,178 miles to 10,171 miles or 24 per cent, is evidence of the benefit already secured through the use of treated ties. At the time of the study (December, 1922), 48 per cent of the ties in tracks were treated.

A comparison of the projected renewals with the actual renewals from 1915 to 1922 inclusive is possible and the interesting fact is shown, despite rather wide fluctuations in four of those individual years, that the net difference between the projected and the actual renewals for the entire period of eight years was only 12,640 ties. During the eight-year period a total renewal of about 20,000,000 ties was made. This in itself is ample testimony of the value and accuracy of the projection.

In order to find the whole effect of the use of treated ties, the statement of renewals required each year was carried beyond 1922, basing it upon the assumptions that renewals in 1923 and subsequently would all be made with treated ties, that they would equal the projected renewals and that the economical cross tie maintenance. The actual renewals for 1923 have been made available since the tables were prepared and are shown but not used in computing projections for subsequent years.

TABLE B - CROSS TIE RENEWAL EXPERIENCE AND PROJECTION FOR THE BALTIMORE & OHIO

Years Ended Dec. 31	Cross Ties Used In Renewals and Construction			Tie Renewals Projected			Tie Renewals Actual Total	Surplus	Deficit	Renewals per Mile of Track Maintained		Miles of Track Maintained	Years Ended Dec. 31
	Untreated	Treated	Total	Renewals of Untreated	Renewals of Treated	Total				Projected	Actual		
1901	2,635,936		2,635,936				2,025,878				248	8,178	1901
1902	2,131,218		2,131,218				1,618,196				196	8,263	1902
1903	2,139,563		2,139,563				1,623,328				192	8,460	1903
1904	2,577,769		2,577,769				1,951,684				225	8,687	1904
1905	2,859,177		2,859,177				2,201,434				247	8,904	1905
1906	2,719,050		2,719,050				2,220,276				242	9,052	1906
1907	2,736,881		2,736,881				2,326,452				254	9,168	1907
1908	2,784,056	24,828	2,808,884				2,456,650				266	9,231	1908
1909	2,557,879	88,258	2,646,137				2,447,695				264	9,260	1909
1910	2,186,999	197,557	2,384,556				2,043,069				218	9,370	1910
1911	2,167,717	308,097	2,475,814				1,962,707				206	9,548	1911
1912	2,717,380	425,377	3,142,697				2,698,566				278	9,708	1912
1913	2,363,605	399,316	2,762,921				2,536,067				259	9,786	1913
1914	1,653,630	629,519	2,283,149				2,171,537				220	9,853	1914
1915	1,937,746	1,267,732	3,205,478	2,661,053		2,661,053	3,062,547	401,494		268	309	9,924	1915
1916	1,904,593	1,386,327	3,290,920	2,669,553		2,669,553	3,093,204	423,651		268	310	9,973	1916
1917	1,508,428	1,121,272	2,629,700	2,615,956	497	2,616,452	2,388,241		228,211	261	238	10,043	1917
1918	1,086,095	1,101,294	2,187,389	2,535,445	2,510	2,537,955	1,963,188		574,767	251	194	10,100	1918
1919	1,472,453	1,075,681	2,548,134	2,462,754	7,840	2,470,594	2,461,941		8,653	244	243	10,133	1919
1920	1,195,480	1,405,907	2,601,387	2,399,505	18,240	2,417,745	2,576,398	158,653		239	255	10,109	1920
1921	957,618	1,396,262	2,353,880	2,294,619	36,290	2,330,909	2,318,465		12,444	230	229	10,126	1921
1922	530,685	1,589,292	2,119,977	2,182,370	61,538	2,243,908	2,096,825		147,083	221	206	10,171	1922
1923				2,077,977	99,848	2,177,825	2,108,151		69,674	214	207	10,171	1923
1924				1,916,506	160,094	2,076,600				204		10,171	1924
1925				1,730,817	238,397	1,969,214				194		10,171	1925
1926				1,599,238	330,179	1,929,417				190		10,171	1926
1927				1,455,943	439,183	1,895,126				186		10,171	1927
	Renewals projected: assuming that actual renewals 1923 and all following years will be equal to projected renewals, that mileage will remain stationary and all ties used will be treated.												
1928				1,275,798	561,811	1,837,309				181		10,171	1928
1929				1,092,678	690,789	1,783,647				175		10,171	1929
1930				882,066	813,411	1,695,477				167		10,171	1930
1931				615,577	931,233	1,546,810				152		10,171	1931
1932				386,367	1,045,217	1,431,584				141		10,171	1932
1933				207,680	1,214,610	1,422,290				140		10,171	1933
1934				84,480	1,281,477	1,365,957				134		10,171	1934
1935				35,073	1,387,672	1,422,745				140		10,171	1935
1936				10,614	1,495,812	1,506,426				148		10,171	1936
1937					1,592,673	1,592,673				157		10,171	1937
1938						1,681,709				165		10,171	1938
1939						1,752,305				171		10,171	1939
1940						1,799,845				177		10,171	1940
1941						1,830,876				180		10,171	1941
1942						1,834,810				180		10,171	1942
1943						1,804,074				177		10,171	1943
1944						1,757,400				173		10,171	1944
	Annual average projected renewal subsequent to 1914, when renewals are uniform per week with an average life of treated ties of sixteen years, will equal					1,600,000	or			158	per mile		

mileage would remain stationary. That extension of the study indicates the following major facts:

First: Renewals required in 1923, 2,177,825 or 214 per mile.

Second: A gradual reduction in renewal requirements until the minimum is reached in year 1934, viz., 1,365,957 or 134 per mile.

Third: A gradual increase in renewals thereafter until the cycle of renewals of all treated ties is covered, reaching a maximum in 1942 of 1,834,810 or 180 per mile.

Fourth: An annual average renewal thereafter (based on the average life of 16 years for treated ties) of 1,600,000 or 158 per mile.

The application of a study of this character to districts or to divisions of a system would enable definite control of the use of ties to be established and would provide data for most

Fuel Committees Act Jointly

AT A MEETING held in Chicago last week the joint committee on fuel conservation of the American Railway Association and a special committee of the International Railway Fuel Association passed on a number of important co-operative measures in relation to the use of fuel oil and coal on various railroads. The meeting was attended by representatives of the operating, mechanical and purchasing departments from railways in all parts of the country, F. H. Hammill, assistant general manager, C. & N. W., presiding. Besides the regular committee members, the meeting was attended by Professor E. C. Schmidt of the University of Illinois and Professor G. A. Young of Purdue University.

The most important action taken by these committees was the approval of a plan for establishing a central agency for the joint investigation and testing of fuel and fuel saving devices. This plan will now be submitted to the board of directors of the American Railway Association for approval and will carry with it the recommendation for the appointment of a research director and corps of assistants.

A definite ratio for equating coal and oil as fuel in con-

sumption and conservation comparisons has been under consideration for some time, and at the joint committee meeting a report was approved advocating a definite ratio of fuel oil equivalent to one ton of coal be recommended to the Interstate Commerce Commission for use in the operating statistics submitted by railways using fuel oil. A further study of this subject based upon original investigation and actual tests may be undertaken later with a view to arriving at an accurate equation of the two fuels on various railways. The relative value of coal and oil fuels is one of the problems needing solution which will be submitted to the proposed research director employed by the American Railway Association. This situation has been outlined by the joint committee on fuel conservation as follows:

"During the past few years a growing volume of fuel oil has been substituted for coal on various railroads. Hardly a railroad today is able to say just exactly what the equivalent of 2,000 lb. of coal, of a certain grade, is, when translated into fuel oil purchased on a gallonage basis, with variations in thermal content, based again upon differences in weight per gallon and percentage of non-combustible matter (water and sediment) which, while running comparatively light in certain oils, is relatively heavy in the case of others. There is, further, but very limited information available as to the measure of loss sustained in heating certain heavy oils to a point where they can be economically consumed.

"This situation has caused certain railroads in the past few years grave concern, with loss of economies that might have been obtained by a more prompt substitution of fuel oil for coal when oil became suddenly available, as usually happens, and with the large mileage now fueled with oil the point at which to let go in the event of a future scarcity of fuel oil will provoke even greater concern, for the reason that in the territory where oil is most heavily consumed the relative development of coal mines is materially below that which obtains generally throughout the country."

Other problems to be submitted to the research director for solution relate to the utilization of lignite coal, the results obtained from relative grades of coal in relation to the cost involved, spark losses, the effect of electrification on fuel consumption per ton-mile and per passenger car-mile, the economic aspects of coal storage, the influence of locomotive design on fuel economy, the introduction of turbine driven and Diesel motor type locomotives, etc.

At the meeting in Chicago the committees decided upon the text of a questionnaire to be submitted to all the railroads for the purpose of determining actual progress toward fuel conservation and what fuel economy practices have been generally adopted. The first three booklets of the American Railway Association's manual on fuel and related economies as compiled by the International Railway Fuel Association were also approved at this meeting and will soon be available for distribution to the railways.

In February this year the following railway car supplies were imported into Canada from the United States: 21 box and flat cars, valued at $27,857; 3 tank cars, valued at $1,311; 168 other cars, valued at $6,826; parts of railway cars, valued at $136,169; 3 motor cars for railway use, valued at $607. This is a report compiled by the Dominion Bureau of Statistics.

Freight Traffic on the Missouri Pacific continued to increase during the month of March. Local loadings amounted to 82,619 cars while receipts from connections were 34,409 cars, making a total of 117,028 cars or an increase of 14 per cent over March, 1923. The number of miles per car per day rose to 31.23 for the month, as compared with 30.77 in February and 21.20 in March, 1923. Passenger trains attained a record of 95.5 per cent on time performance.

Freight Car Loading

Washington, D. C.

Revenue freight car loading continued to decline during the week ended April 5, which was the fifth consecutive week this year in which it has been less than in the week before and the third consecutive week in which it was less than that for the corresponding week of last year. The total was 862,096 cars, a decrease of 34,279 cars as compared with last year and an increase of 156,083 cars as compared with 1922. A large part of the reduction was in coal loading, which has been running light for some time and which was also reduced this week by the holiday on April 1 observed by many of the miners. Coal loading was 40,975 cars less than it was during the corresponding week of last year. There was a decrease also in all other classes of commodities except forest products and l.c.l. merchandise, which generally shows an increase when miscellaneous loading falls off and an increase in which is often said to represent more "hand to mouth" purchasing. All districts showed a reduction as compared with last year.

For the week ended March 31 the average surplus for the railroads of the United States was 248,301 cars, including 135,976 coal cars and 81,342 box cars. This was an increase of 35,208 cars as compared with the preceding week. The Canadian roads had a surplus of 10,550 cars, including 7,000 box cars and 700 coal cars.

The summary as compiled by the Car Service Division of the American Railway Association follows:

Revenue Freight Car Loading, Week Ended April 5, 1924

Districts	1924	1923	1922
Eastern	211,998	222,224	164,086
Allegheny	178,339	194,457	150,231
Pocahontas	34,132	35,743	33,641
Southern	138,415	139,919	118,228
North Western	109,822	115,289	94,266
Central Western	128,746	132,707	99,448
Southwestern	60,644	56,036	46,113
Total Western Districts	299,212	304,032	239,827
Commodities—			
Grain and grain products	35,296	39,306	31,483
Livestock	28,595	30,230	24,775
Coal	123,220	164,195	69,106
Coke	12,295	16,076	8,598
Forest products	77,023	73,825	54,371
Ore	11,842	15,346	8,337
Mdse., l.c.l.	251,481	234,506	243,032
Miscellaneous	322,344	322,891	266,311
Total	862,096	896,375	706,013
March 29	907,548	936,274	821,808
March 22	908,651	916,818	837,241
March 15	916,953	904,116	815,082
March 8	929,505	905,344	820,886
Cumulative loading to date	12,449,370	12,213,115	10,607,150

Revenue car loadings in Canada for the week ended April 5 amounted to 53,922 cars, which was a decrease from the previous week of 3,923 cars. The largest decrease was in pulpwood of 1,306, practically all roads in the east showing a falling off. Grain and grain products and coal also showed decreases while merchandise made a slight increase. Compared with the corresponding week last year there was an increase of 5,992 cars or 12.5 per cent and the cumulative totals from the first of 1924 show an increase of 13.3 per cent or 733,362 cars for 1924 as compared with 646,904 cars in the same period in 1923.

Car loadings were as follows:

Total Car Loadings in Canada

Commodity	For the week ended 1924 March 22, cars	March 29, cars	April 5, cars
Grain and grain products	7,466	6,432	5,607
Live stock	2,418	2,392	2,371
Coal	5,996	6,288	5,742
Coke	266	260	262
Lumber	4,081	4,068	3,844
Pulpwood	5,168	5,056	3,750
Pulp and paper	2,188	2,207	1,919
Other forest products	3,746	3,048	3,107
Ore	1,135	1,202	1,102
Merchandise, L.C.L.	14,611	15,129	15,332
Miscellaneous	12,505	11,763	10,886
Total cars loaded	59,580	57,845	53,922
Total cars received from connections	37,680	35,149	35,693
Total cars loaded for corresponding week, 1923.	47,248	46,376	47,930

Hearing on Bills to Repeal Section 15a

Representatives of Carriers Say Repudiation of Principle of Fair Return Would Have Bad Effect

WASHINGTON, D. C.

THE SENATE COMMITTEE on interstate commerce concluded on April 16 its hearing of the railroads in opposition to a repeal of section 15a of the interstate commerce act. The committee had originally announced that three days of a morning session of an hour and a half each would be allowed to each side and that the railroads might have an additional session for rebuttal because of the unusual procedure by which they were asked to testify first. However, so much time was taken up in discussions of procedure and questioning by members of the committee, including a few speeches by some of them, that three sessions, on April 9, 10 and 11, were taken up with the first witness, Daniel Willard, president of the Baltimore & Ohio. He was followed by Howard Elliott, chairman of the Northern Pacific, whose statement had not been finished on April 12 when Chairman Smith of the committee announced that the railroads had used up their time but that he would take up with the committee the question of extending it because there had been so many inerruptions. Mr. Elliott returned on April 14 but there was no session of the committee because of a Republican caucus. On April 15 he read a little more of the statement, interrupted by several arguments with Senators Smith, Gooding and Howell as to how nearly section 15a approaches the character of a "guaranty," a "conditional guaranty" or an "assurance," and when the time for adjournment came asked if he could not file the remainder of his statement and return to New York. Both Mr. Willard and Mr. Elliott had fortified themselves with dictionary definitions of the words "guaranty" and "assurance" but made little headway with the three senators because the latter insisted on using their own definitions of the words used in the Webster definition. Senator Howell got Mr. Willard to admit that the act carries some "assurance" to railroad investors and then insisted that "assurance" was the same as "insurance." Senator Gooding's chief contribution to the discussion was that the act is "a farce" because, he said "the great railroads of the country" are earning much more than 5¾ per cent and the Interstate Commerce Commission has no supervision over the expenditures of the railroads to prevent extravagance. The repeated assertions of the railroad men that the roads have not yet got up to the prescribed rate of return and that in spite of that fact the Interstate Commerce Commission has ordered general reductions in rates seemed to have little effect.

The concluding witnesses for the railroads on April 16 were S. T. Bledsoe, general counsel of the Atchison, Topeka & Santa Fe, and N. H. Loomis, general solicitor of the Union Pacific. S. H. Cowan, representing a number of livestock shippers' associations, was to be heard on Thursday in opposition and representatives of the National Association of Owners of Railroad Securities were to be heard on Friday.

Mr. Willard concluded on April 10 his statement which was reported in last week's issue, but returned next day for questioning. After he had read the percentages showing that the railroads have not yet received as much as the fair return contemplated by the law, Senator Howell remarked that they indicated absolutely no chance of rates being reduced. Mr. Willard said he had no thought of giving such an impression but that gradual reductions in costs and increased efficiency ought to make possible a gradual reduction in rates. He said that he did not think wages would come down unless the cost of living comes down but that he looked for reductions in the prices of materials and supplies. He pointed out that many reductions in rates have already been made, although the railroads have not had a fair return, and that reductions are being made all the time. Without continual increase in efficiency, he said, the railroads would not have been able to live at all with rates increased only about half as much as prices and wages. If the business of this year should be as large as last year he believed that the roads might earn in excess of the prescribed percentage but he said it is now uncertain what the volume of traffic will be and while some costs will probably be reduced there is a tendency for wages to increase. In reply to a question by Senator Howell the day before as to the percentage of increase in certain elements entering into the cost of operation on a ton-mile basis Mr. Willard on April 11 submitted the following:

There can be no complete separation of railroad expenses between freight and passenger service, and no separation of such expenses was undertaken prior to Jan. 1, 1920. Since then reports have been made to the Interstate Commerce Commission under which the expenses solely related to freight and passenger service, respectively, are stated, and the expenses related in common to freight and passenger and allied services are apportioned to the respective operations on a formula prescribed by the Commission. The statistics for 1922 and 1923 on this basis are not available.

The common factor for the periods—and one which is sometimes used for the purpose of comparison is the so-called "Traffic Units," that is, the sum of the freight ton miles and passengers one mile. On the basis of traffic units the expense of 1914 compare with 1923 as follows:

	1914	1923	Increase, per cent
Total compensation of employees—per traffic unit (mills)	4.19	6.65	58.71
Average compensation per hour—per billion traffic units (mills)	.86	1.39	61.63
Fuel—locomotives—per traffic unit (mills)	.74	1.15	55.41
Material, supplies and miscellaneous—per traffic unit (mills)	1.73	2.93	69.37
Taxes—per traffic unit (mills)	.42	.74	76.19

This is not submitted as a conclusive basis for comparison, but is that available which will, perhaps, measurably answer the inquiry of Senator Howell.

In the earlier testimony the factors of cost were shown to have increased as follows:

	Per cent
Increase in annual average compensation per employee	98
Increase in rate per hour 1923, compared with 1916	126
Increase in cost of fuel	116
Increase in cost of materials	57
Taxes	145

That the cost per traffic unit has not increased in proportion to the cost of labor, fuel, materials, and other expense factors is due to improved operation and economies effected, with the aid of new capital and the renewed interest and fuller co-operation of the employes. Since 1914 approximately $5,000,000,000 has been invested in larger and more effective locomotives and cars and improved track and other facilities.

The average tractive power of locomotives which in 1914 was 30,705 pounds had, in 1922, increased to 37,441 pounds or 21.94 per cent. The average capacity of freight cars which in 1914 was 39.10 tons had increased in 1922 to 43.10 tons, or 10.23 per cent. In 1914 the average train load was 464.6 tons while in 1923 it was 644.62 tons, or an increase of 38.75 per cent.

In 1923, 413,562,132,000 ton miles were handled, with 641,556,000 freight train miles. Had the average train load in 1923 been the same as in 1914 it would have required 248,590,000 additional train miles which contributed largely to off-setting the increased basis of costs.

Mr. Elliott told the committee that the repeal of section 15a of the Transportation Act would not only shake the confidence of the investing public in the railroads and be detrimental to shippers and employees, but that it would also be a reversal of the forward step taken by Congress when it passed the Transportation Act. Mr. Elliott said in part:

"To my mind there is more protection to the 110,000,000 people who are using the railroads, to the 2,000,000 people who work for the railroads, and to the 2,000,000 people who own the securities of the railroads, besides the 50,000,000 who are interested in life insurance policies, savings banks, etc., if the Congress in its wisdom should stop for the present in trying to make amendments to the Transportation Act and permit stability of regulation and stability of railroad conditions.

"As the development of the country continues, there will be many opportunities for investors to select industries when the chance of return is greater than in railroads. To cancel 15a would be a notice to the investing public that the Congress was unwilling to continue a reasonable and protective provision of the Act which is helpful in obtaining new capital for railroads. Such cancellation would be harmful to existing securities so widely distributed; would hurt the credit of the roads and make it more difficult to obtain new capital.

"This rule is a means to the end of obtaining adequate railroad service under private operation at the lowest rates that are consistent with paying all costs of the service, operating expenses (including reasonable wages to employees) taxes, and reasonable payments for the capital now employed and to be employed. It would be a reversal of the forward step taken in 1920 to make of our wonderful railroad system all that it should be in preparing for the great work that must be done by the railroads as our population grows.

"When the Transportation Act was passed with the protective features, including 15a, there began to be a feeling of hope and confidence in the business. To replace 15a now, would shake that confidence and make it increasingly difficult to go on with the work of expanding facilities as the country develops.

"The Transportation Act as a whole is an honest and constructive effort resulting from many years of discussion and debate to provide a reasonably stable and yet flexible system. It has hardly had time to function under settled, economic conditions and Congress should move very slowly in changing it. Without section 15a the Act cannot produce the results desired by a majority of the people.

"From 1920 to 1924 we have tried a new plan. It has worked so far to give the public service, and railroads have been hopeful that it would give protection to the industry so that it could grow as the country grows. If continued and administered in the spirit that animated the framers of the Act, I believe that protection will be forthcoming. Why change now when the Act has been in effect only four years? Why take a step that is likely to cause hesitation and uncertainty again in our railroad system? The safe course today is to give the Transportation Act with 15a a further trial.

"I think all people admit that agriculture is one of the great and important basic industries of the country; but so is transportation. We must have successful agriculture and successful transportation or progress in other forms of industry will be checked. It is only a little over two years ago since agriculture was complaining because railroads were not adequately equipped to furnish all the facilities necessary. It seems obvious, therefore, that while everything should be done to foster and protect agriculture, it will not do to take steps that will weaken the development of our transportation system and not permit it at all times to keep pace with the industrial development of the nation. While agriculture is having a difficult time in parts of the northwest, so are the railroads, and they need help if they are to continue to grow and be ready for the next uplift in that great country, which is sure to come some day."

In 1913, Mr. Elliott said, the six principal railroads in the northwest had a net railway operating income of $110,899,391 or 29.7 cents out of each dollar of revenue. In 1923 they had $87,142,126 or 13.8 cents out of each dollar, while meantime there has been invested in road equipment $597,000,000 so as to be able to give better service in that part of the country. The Northern Pacific Railroad in 1916 earned a rate of return of 6.71 per cent, Mr. Elliott said, while in 1923 it earned only 2.98 per cent.

Mr. Elliott testified that section 15a had not prevented readjustment in freight rates, the annual report of the Interstate Commerce Commission showing that reductions during the calendar year 1923 lessened the total freight transportation charges paid by the shipping public by more than $500,000,000.

"Section 15a helps to stabilize the general situation," the witness said, "by considering the rates for different groups of railroads instead of for one railroad at a time or for one small piece of territory. As we are a nation and not a confederation of states, and as we need a national system of transportation that is adequate in every way, it seems very desirable that the federal power shall be in control and that the mandates of Congress announcing the principle that rates shall be sufficient to make a fair return should not be withdrawn because such withdrawal will be a shock to the investing public and make it increasingly difficult to obtain the necessary capital and be a step in the direction of government ownership which I believe the country does not want. Frequent changes in our national policy of regulation are uncertain to business and place an unnecessary burden upon it. Such changes also tend to destroy confidence.

"There is too great a tendency to believe that the rates of the railroads are the primary and potential cause of success or failure in industry and agriculture and that by reducing rates, adverse economic conditions, errors in judgment and failures in management on the farm, in the factory and in the mine can be corrected and avoided. Rates are, of course, important, but their effect upon the success of any business enterprise has been magnified and there is danger that the theory of reducing rates in an effort to improve business and agricultural conditions will do more harm in preventing the furnishing of adequate facilities than any possible good to be obtained by reductions.

"The railroad system of the United States is for the purpose of carrying people and property. It ought not to be used as a carrier and a cure-all for the economic troubles of the country. These economic troubles cannot be cured by reducing rates so that the railroads are crippled and conditions created that may force government ownership to which this country is opposed. In the long run it will not help agriculture to starve the railroads so that they cannot give service.

"The railroads of the country gave the largest amount of service in 1923 than ever was given before. The country is going to continue to grow, and in spite of the magnitude of the work done by the roads for the people in 1923, we must look ahead to 1933, 1943 and 1953. Why change now? The Transportation Act may not be perfect; Section 15a may not be perfect, but taking the Act as a whole, Section 15a is very important and a vital part of it. I feel strongly, not only as a railroad officer, but as a freight shipper, that the Act ought to be let alone—section 15a ought to be let alone, certainly until the after-effects of the World War are worn off more than they have been up to the present time.

"Had the 1914 rates been in effect in 1923," Mr. Elliott said, "the saving to the public in freight rates on shipments of agricultural products, including live stock, on railroads west of the Mississippi river would have amounted only to 1.31 per cent of the value of the products. Yet, such a reduction, he pointed out, would seriously affect the earnings of the railways."

"The value of the commodities," said Mr. Elliott, "is estimated at $9,635,000,000 for 1923, and the reduction in the revenues of the railroads of $126,106,624 is only 1.31 per cent of the value of the products. This amount would not accrue to the farmer, but would be absorbed by various middlemen and in reduced prices to the ultimate consumer. The loss of revenue to the railroads would, however, be substantial and would affect their ability to give present and future service to the public.

"In the long run it will not help agriculture, industry and commerce to starve the railroads so they cannot give service."

Mr. Elliott testified that the increase in the western district in freight rates on products of agriculture and live stock has been less than on other commodities, being in 1923 only 31 per cent above the rates in effect in 1914, while the increase during the same period in the ton mile rate on all carload business, other than agricultural products and live stock, was 50 per cent.

While the increase in freight rates compared with 1914, Mr. Elliott continued, was 31 per cent, the farmer spent in 1923 for operation and maintenance of motor vehicles $1,120,973,600 or an increase of more than 1,743 per cent over that spent by him for similar purposes in 1913. In addition the direct taxes paid by the farmer showed an increase during the same period of more than 185 per cent while the amount paid by the farmer for interest on bank and mortgage loans increased more than 140 per cent.

"It is interesting to note," said Mr. Elliott, "that the increase in the value of farm products in 1923 over 1922 was $571,772,290 more than the total freight paid. In the western district alone, the increase in the value of all farm products was $396,429,000 more than the total freight paid."

Regarding the charge that Section 15a provides a "guarantee" for the railroads, Mr. Elliott said:

"There is no guaranty, and there is no assurance of a return to the railroads. The wording of section 15a in this regard can be considered nothing more than the statement of a policy. There is no responsibility directly falling upon the Commission to make good from any funds whatsoever any deficiencies that may occur under the policy established. The very experience of the railroads during the past four years is positive proof that no guaranty or assurance of financial return does exist."

During Mr. Elliott's testimony Senator Howell again asked what hope the people can have of reductions in rates if the railroads only earned about 4½ per cent last year with the biggest business in their history and it is necessary to wait for reductions till they get up to 5¾ per cent. Mr. Elliott referred to the reductions already made, as cited in the annual report of the Interstate Commerce Commission, and also said that the railroads expect a gradual reduction in expenses as well as possible increases in traffic. Senator Howell said the facts show that "we have got to adopt some different principle" for regulating rates but when Mr. Elliott asked what other principle he would suggest that would pay the bills he said he was not arguing that point. At this point Senator Gooding interrupted with a criticism of the railroads for increasing the wages of the conductors and trainmen, saying that it would have to be followed by increases "all along the line" and that "that is not practicing economy." Mr. Elliott said that it was started by the New York Central and followed by some other eastern roads that were in a little better position than the western roads and that the latter had opposed it as long as they could. Senator Cummins said he would like to advert back to Senator Howell's remarks. "Why should we reduce rates unless we can reduce these things that enter into the cost of transportation?" he asked. "To me the matter is not at all hopeless. What we need is proper relations between these things. I am not disturbed about freight rates if we can get the prices of agricultural products up to where they ought to be."

Senator Smith asked if there could not be an agreement that the section may be defined as constituting a "conditional guaranty." Neither Mr. Willard nor Mr. Elliott nor Senator Cummins would agree to this although the railroad men said they would admit that the section represents some "assurance." Mr. Elliott said that for Congress to repudiate the principle now would have a serious effect, far worse than if it had never been put into the law. Senator Gooding persisted in discussing the subject as if it meant that each road was to have a return of a given percentage. He also raised many questions as to how the Interstate Commerce Commission can assure itself that the roads are under "honest, efficient and economical management" saying he had been informed the commission had no supervision over expenditures. Mr. Thom said that the commission has given a great deal of thought to that matter and has created an organization to check up the expenditures for the purpose of satisfying itself on that point. Senator Smith said he had asked the commission to furnish some information to the committee on the subject. Senator Gooding also insisted that section 15a promotes extravagance in expenditures to avoid having excess earnings to report to the government. Mr. Thom asked why a railroad should waste a dollar to avoid paying half of it to the government when it might save half.

When the hearing was adjourned on Saturday Alfred P. Thom, general counsel for the Association of Railway Executives, asked for time for statements by S. T. Bledsoe and N. H. Loomis and Bird M. Robinson, president of the American Short Line Railroad Association, said there would be "an awful squeal" if the hearings were adjourned without an opportunity for the short lines to be heard.

When the allotment of time was originally announced Mr. Thom appealed for time for an adequate presentation of the matter, saying that many members of the committee are new and that the question of a repeal of section 15a represents a very different issue from that presented when it was under consideration in the first place. He said the fact that the committee was pressed for time should not force it into an ill-considered decision. Chairman Smith said that the subject had been thoroughly discussed at previous hearings and that any member can read the facts exhaustively. Senator Cummins said he intended to offer as a part of the record the testimony previously taken and that he was having prepared tables to bring it down to date. "I believe in section 15a," he said, "and intend to do my best to sustain it."

U. S. Chamber of Commerce Opposes Change in Law

Opposition to any change in the principles underlying the Transportation Act was recorded on April 15 by the Chamber of Commerce of the United States, appearing as the spokesman for more than a thousand commercial organizations throughout the country. The position of the chamber and its investigations and study of the transportation problem were explained by George A. Post, chairman of the committee on Government Relations to Transportation, and Edward J. Frost, vice-president of William Filene Sons Company, of Boston. The latter presented statement by Julius H. Barnes, president of the National Chamber, in which he said: "Critical shortages of railroad service in the past few years have been directly due to inadequate railroad expansion. The continued growth of commerce requires constantly expanding facilities. It is not sufficient that rates should not be confiscatory, but rates must be fairly framed to continually provide more new facilities. The outstanding importance in the rule of rate making is the duty placed upon the Interstate Commerce Commission of fixing rates which have regard for this necessity of enlarging transportation. This affirmative duty should rest upon the responsible regulating body which establishes rate levels. Otherwise, the growth of trade, which in America responds to constantly widening living standards, would be checked and defeated by reaching the limits of established transportation. This check would fall with severe losses upon all industry and particularly upon the American farm.

"Business manifestly approves that feature of the rule of rate making which protects the public interest by requiring honesty, efficiency and economy of management. Business approves the administrative discretion given the commission to flexibly prescribe different rates for different sections and to adjust unreasonable or unjust particular rates. Business approves the absence of any guaranty as to a rate of return to the individual railroads, because that might tend to restrict incentive to the best possible management performance. Business approves the provisions of the rule which maintain competition between carriers as to service. Business feels that while the demonstration to date under this rule of rate making is one of effective accomplishment, the door should not be closed to proper discussion of improvement in the provisions of the Transportation Act.

"There is this phase of the present business situation in this country which legislation should take seriously into account. While business is fundamentally sound, there is manifest a condition of hesitancy which apparently bases primarily on a lack of confident enterprises, and this again on the realization that business must face not only its own ever-present problems but the additional ones of possible new influences and problems by reason of legislative changes. Modern business has become so vast and complex, so dependent on large requirements of capital and credit, by its character of large scale production through machine equipment that it is as never before dependent on the enterprise and resourcefulness that base primarily on confidence. It is greatly to be desired that among other steps of precaution and encouragement, there be at an early date the elimination of agitation for experimental changes in the Transportation Act during this period of trial and demonstration."

Mr. Bledsoe testified in part as follows:

"In presenting objections to the proposed repeal of section 15a I am somewhat handicapped in that I am not informed of the reasons which it is thought justify the proposed repeal. In the absence of such information I assume that the reasons are those that have been, from time to time, reflected in the criticisms of section 15a as they have appeared in the Congressional Record, in speeches and in the press. The criticisms which have come under my observation directed against section 15a of the act are in the main:

(1) That it guarantees to the carriers a fair return upon the value of their property employed in the transportation service;

(2) That it is responsible for the higher freight rates and passenger fares now prevailing than the pre-war rates and fares;

(3) That it prevents the reduction of excessive and unreasonable rates to a reasonable basis.

"It is my purpose to undertake to demonstrate that section 15a does not as a matter of law guarantee the carriers a fair return; that as interrupted and applied by the commission it has not operated to yield a fair return; that it is not responsible for the present schedule of rates and fares; that it has not at any time prevented or stood in the way of a reduction of excessive, unreasonable, or unjust rates; and that reductions in rates because they have been found to be unreasonable and unjust have been continuously made by the commission, notwithstanding the carriers were at all times earning under existing schedules substantially less than a fair return upon the value of their properties employed in the transportation service as found by the commission.

"Practically all of the objections to this section have their origin and foundation in the repeated charges in the public prints and in speeches of men who were supposed to be informed that section 15 (a) in fact guarantees the carriers a fair return at the expense of unregulated business. I am firmly convinced that 90 per cent of the opposition to section 15 (a) had its birth, nourishment, and development in the belief that the carriers are thereby guaranteed a return. There is nothing in the language of section 15 (a) to justify the assertion of a guaranty, and the commission held in October, 1921 (64 I. C. C. 95) that, *"the Transportation Act does not guarantee the carriers a return,"* and in May, 1922 (68 I. C. C. 81) held that, *"the determination of the percentage implies or carries with it no guaranty. Read in connection with the provisions for recapture of one-half of the excess above 6 per cent it is, instead, a limitation."* Section 15 (a) therefore, instead of being a guaranty of a return is a limitation upon the earnings of the more prosperous carriers.

"No criticism of the commission is intended in commenting on the failure of the rates prescribed to yield a fair return. Fluctuations in the volume and character of the traffic made a reliable forecast of the amount of revenue that would be earned under any particular schedule of rates practically impossible.

"Section 1 of the Interstate Commerce Act requires that all rates and fares prescribed by the commission shall be just and reasonable, and *Section 15 (a) provides that whatever action the commission takes in prescribing rates and fares to yield a fair return must be in the exercise of power to prescribe just and reasonable rates.* It is clear that the commission is not authorized and, it may be added, has never undertaken to establish unreasonably high or excessive rates in order that the carriers may earn a fair return. The mandate that rates and fares shall be just and reasonable is as applicable to and as controlling of rates and fares prescribed under section 15 (a) as under section 1 of the Interstate Commerce Act, and the commission so declared, *In the Matter of rates on grain, grain products, and hay.*

"The commission in 1921, the year in which the carriers earned only 3.33 per cent upon the value of their property employed in the transportation service, required a reduction in live stock rates, and effective January 1, 1922, ordered a reduction in grain rates from 15 to 20 per cent, and in May, 1922, a reduction of approximately 10 per cent in freight rates on all classes and commodities, except live stock and grain. All of these reductions were made when the carriers were earning less than a fair return, and all with section 15 (a) in effect.

"The carriers of the United States in 1916 operated under the lowest schedule of rates ever in effect in any country at any time, the earnings being only .707 cents per ton per mile. The rate peak was reached during the year 1921, in which period the carriers received 80 per cent more for hauling a ton of freight one mile than in 1916. For the year 1922 the carriers received 66 per cent more for hauling a ton of freight one mile than they did in 1916; and for the year 1923 approximately 58 per cent more than in 1916.

"If the 1923 earnings per ton be compared with 1915 instead of 1916, we have an increase of 54.6 per cent instead of 58 per cent. In the Western district, where the rate reductions have been more drastic, the average revenue per ton per mile was only 40 per cent greater in 1923 than in 1915.

"This clearly establishes that the commission has without exception and without hesitation reduced rates found to be unreasonable or excessive, and has prescribed in lieu thereof reasonable and just rates, although at the time the carriers were earning substantially less than a fair return and have not found section 15 (a) an obstacle to such reduction.

"It may be added that for the year 1921 Class I railroads had a net railway operating income available for a return upon the value of railroad property employed in the transportation service, 10.9 cents out of each dollar of revenue received; in 1922, 13.7 cents; and in 1923, 15.3 cents. If in each of these years rates and fares had been made barely sufficient to pay operating expenses and taxes there would have been a reduction in 1921 of 10.9 per cent, and in 1922 of 13.7 per cent, and in 1923 of 15.3 per cent.

"Section 15 (a) is but a legislative adaptation of the method employed by the commission, but imposing a limitation upon the earnings that may accrue to the more prosperous carriers as a result of rate making on a group basis. The only new departure involved is the recapture of one-half the earnings in excess of 6 per cent upon the value of the property employed in the transportation service.

"Constitutional provisions protecting public service corporations against confiscatory rates are negative in form and standing alone are an inadequate protection against confiscatory legislation and regulation. The Transportation Act, or rather section 15 (a) of the Interstate Commerce Act, merely expresses in the affirmative what is expressed in the Constitution in the negative. It is a direction to the agency of Congress, the Interstate Commerce Commission, that in exercising the power vested in it that the constitutional provisions prohibiting the making of rates which do not yield a fair return are to be observed as a vital factor in determining the reasonableness of rates and the adequacy of the return.

"A consideration of the net railway operating income of Class I carriers for 1920 to 1923, inclusive, demonstrates that there has been a gradual but slow progress in the establishment of a normal relationship between revenues and expenses of the carriers. This has been accomplished in an unusually difficult period of economic and financial adjustment. This gradual approach to a normal relationship between operating revenues and operating expenses, and the reliance by the investing public upon the belief that Congress had adopted a policy recognizing the right of the carriers to a fair return upon the value of their property employed in the transportation service has done much to restore the credit of the carriers, although as yet their financing has been limited to borrowing, with occasional sale of a limited amount of stock under exceptional conditions. While the immediate purchasers of railroad securities may be banks or trust companies, they are merely agents for the distribution of such securities to the final purchasers, who in the main are life insurance companies, savings banks, and individual investors, who generally purchase in relatively small amounts.

"Will not a repeal have the effect of an announcement to the investors in securities of railroad companies that Congress has declared that it no longer recognizes the right of

the carriers to a fair return upon the value of their property employed in the transportation service, and that it has withdrawn all provisions intended to secure such fair return? The inevitable result must be a very great impairment of the credit of the carriers, and a very great enhancement in the cost of securing funds necessary to make additions and betterments and other improvements of their property to meet transportation needs. It is respectfully submitted that no beneficial results can or will follow the repeal of section 15 (a), but most disastrous results may and probably will follow such repeal."

Mr. Bledsoe did not finish his prepared statement but devoted much of his time to giving specific answers to questions raised by the senators, and apparently made a very favorable impression. Before he had concluded all the members of the committee present had expressed an opinion in favor of a reduction in the rate of interest charged by the government on loans to railroads, although this suggestion was advanced by Senator McLean, not by the witness, and Chairman Smith said he had been contemplating proposing such an amendment to the law. Also Senator Gooding, who had been outspoken in his criticisms of the railroads throughout the hearing, commented on Mr. Bledsoe's fairness and said that "any man who is not willing to give the railroads a fair return on their investment is an undesirable citizen."

In reply to a question by Senator Gooding as to whether he agreed with the vice-president of the New York Central, who, Senator Gooding said, had stated that the increases in wages allowed to the conductors and trainmen would require an increase in rates, Mr. Bledsoe said he did not think that he had made such a statement, but that he would not agree that they are likely to result in any increase in rates. He had heard the amount of the increase estimated at $35,000,000 for the train service men, and when Senator Gooding said this would, of course, mean increases to the other employees Mr. Bledsoe replied that the principal contention of the brotherhoods was that their advances had not kept pace with those of other classes. He said the western roads had carried their opposition about as far as they could without danger of an interruption of service.

In connection with his discussion of the so-called "guaranty" Mr. Bledsoe read the text of the guaranties for the period of federal control and for the six months following, in which the words "The United States hereby guarantees" were used to show the difference, he said, between a "real guaranty" and an expression of opinion by Congress that the railroads were entitled to a fair return.

When Senator Howell asked his question as to when the people may hope for rate reductions Mr. Bledsoe gave the figures showing that average ton-mile earnings for 1922 applied to the tonnage of that year represented a saving to the shippers of $336,000,000 as compared with the year before, and that the average for 1923 represented a saving of $657,000,000 as compared with the average for 1922, while the railroads' percentage of return had at the same time increased. "You ask when rates can be reduced," he said, "and I say they have been reduced over a billion dollars already. If you were to have to wait until the railroads reach 5¾ per cent before any rates could be reduced you might have to wait quite a while, depending upon the traffic, but you haven't had to wait. There have been reductions every day, every month and every year since the rates were advanced."

Reduction of Interest on Government Loans Proposed

When Senator McLean raised the point that the government is charging the railroads 6 per cent interest on loans while allowing the railroads a less return, Senator Gooding said that that is "unfair" for the government to ask a profit of this kind, and Chairman Smith said he had been thinking of an amendment to the act "to increase the utilization of the recapture fund so that it might be of some assistance to the shippers instead of a burden upon them." Mr. Thom said that the New York, New Haven & Hartford and the Chicago, Milwaukee & St. Paul and some other roads that have had large loans from the government are very much interested in this question, and that he had been asked to see if the government would look with favor upon the idea of reducing it. Senator McLean said he thought the suggestion worth considering, whereupon Chairman Smith stated that some members of the committee are already preparing an amendment for the purpose. Senator Howell also indicated approval of the idea, but said he would be inclined to go farther than its application to the recapture fund. "I am convinced," he said, "that we have no hope of a reduction of rates unless we can find some new principle. One of my ideas is that the government should furnish money where the railroads cannot get it at a reasonable rate, at the cost of the money to the government, but only on prior lien security and on the condition that the railroad should deduct the amount of money it gets from the government from its valuation and not be entitled to claim a return of more than 4½ per cent, for example, instead of 5¾ per cent, on that amount. The only advantage of public ownership is in the better credit that the government can afford, and if the government could furnish funds at the lowest possible rate we would be on the road to the lowest possible rates without the disadvantages of public ownership."

In reply to Senator Gooding's assertions that the Interstate Commerce Commission has no supervision over railroad expenditures Mr. Bledsoe said he had taken pains to inquire at the commission's office, and he presented a memorandum from information furnished by Commissioner Potter that Division 5 of the commission is charged with an oversight over the railroad expenditures and has been conducting investigations through statistical comparisons and reports, policing of accounts and through its service inspectors, of the efficiency and economy of management. The commission has been engaged in an investigation of maintenance of equipment expenditures, he said, ever since the passage of the Transportation Act. Mr. Loomis said:

"By this section Congress recognized the constitutional right of the railroads to a reasonable return upon the value of the property used for transportation services and established a procedure for determining what a fair rate of return from time to time was. It has been decided time and again by the Supreme Court that the railroads are entitled to a reasonable return upon the value of their property. Section 15 (a) is based upon this constitutional right. It merely gives notice to the world that Congress has resolved to do its duty towards the railroads, and that those who are willing to put their surplus funds into railroad enterprises for the benefit of the public will be protected to the extent mentioned in the statute. It constitutes a declaration of honest and constructive intentions on the part of Congress for the purpose of inducing the people to put their money to a public use and thereby to provide adequate transportation facilities for the public.

"The recovery of the railroads from the conditions prevailing at the close of the war and their ability to make the record of 1923 was based very largely upon the encouragement given to them and to the investing public by the provisions of section 15 (a). The repeal of that section would indicate that Congress no longer had the intention of observing the constitutional rights of the railroads, but has concluded to leave the enforcement of those rights to the courts. Congress cannot afford to defeat or retard railroad development by unfriendly legislation. The encouragement given by section 15 (a) should be continued and the Interstate Commerce Commission should be left free to adjust rates as conditions seem to require it."

Proposed Railroad Legislation in Congress

Although 172 Bills and Resolutions Have Been Introduced No Bill Has Been Passed in Four Months

WASHINGTON, D. C.

A TOTAL OF 172 BILLS and resolutions proposing new railroad legislation or the repeal of laws now in effect had been introduced up to April 12 in the Sixty-eighth Congress, which began its sessions on December 4. As the total number of bills introduced in Congress up to April 12 was 11,717, including 3,083 in the Senate and 8,634 in the House, the proportion of railroad bills is perhaps not unduly large, but the passage of some of the bills would have most far-reaching effects. The bills mentioned include only those more or less directly affecting the railroads as transportation organizations and do not include a number of others which affect corporations generally, and, which while primarily dealing with other subjects would also directly or indirectly affect the railroads to a considerable extent. In the latter class are numerous bills to regulate the transportation in interstate commerce of various articles, intended as a regulation of the commerce itself rather than of the transportation per se, and also bills relating to agriculture, coal, standard time, weights and measures and court procedure. While many of the bills would probably not be characterized as particularly hostile to the railroads, the great majority of them would have the effect of reducing their revenues or increasing their expenses, or both, and very few can be considered in any way in the interest of the railroads. The latter class would include a bill introduced by Senator Shortridge of California providing for the reimbursement of the Southern Pacific for the cost of closing and controlling the break in the Colorado river in 1906 and 1907 at the request of President Roosevelt.

No railroad bill has yet been passed by Congress at this session; in fact no important legislation has as yet been enacted. The Senate has passed two railroad bills, one to prohibit the use of wooden cars in front of or between steel cars, and one to increase the period in which shippers may file claims for overcharges.

The Senate committee has held hearings on several bills and has favorably reported several bills or resolutions, while it is now engaged in holding hearings for an hour or so a day on the various bills to repeal section 15-a.

The House committee on interstate and foreign commerce has held hearings on the Hoch resolution and the bill to increase the locomotive inspection force of the Interstate Commerce Commission, which was reported on April 11.

The present outlook for important railroad legislation at this session is regarded as doubtful if present plans to adjourn Congress early in June are carried out, but action on necessary appropriation bills has been so delayed that a summer session of Congress may be necessary and in that event more time would be afforded for railroad legislation. It is frequently stated by those in close touch with Congress that there are enough votes to pass some of the bills which are very unfavorable to the railroads if the issue could be clearly presented but there are many degrees of feeling on the subject and some who would vote for one of the less radical bills might not be inclined to do so if the committees should report out a more radical bill on the same subject.

The bills and resolutions may be roughly classified as to their purpose and subject as follows:

Rates	59	Types of equipment	5
Labor	27	Locomotive inspection	5
Water transportation	12	Valuation	5
State commissions	9	Freight claims	4
Time for filing claims	8	Interlocking directors	4
Bills of lading	6	Consolidation	3
Repeal of regulatory legislation	5	Miscellaneous	27
Safety, accidents reports	5		

While the total of this column is 184 it includes only 172 bills as there are duplications where one bill covers several subjects and is included in one or more classifications.

The most numerous class of railroad bills includes those dealing with rates, most of them intended, in one way or another, to bring about reductions in rates, although one or two perhaps are not intended directly for that purpose but arise from objections merely to the method of rate-making contemplated by the present law. Of the rate bills there are 59, of which 30 are to prohibit the collection of a surcharge in connection with the payment for parlor or sleeping accommodations. Ten of these bills have been introduced in the Senate and 20 in the House. There are also 29 other rate bills, including seven to amend the long and short haul provisions of the fourth section of the act and three bills providing for the sale of mileage books at a reduced rate. It is probably a fair statement to say that the long and short haul bills also are intended to bring about reductions in rates to certain points, although they might not actually have that effect. Also some other bills, such as those dealing with valuation or the jurisdiction of state and federal commissions, are doubtless primarily intended to affect rates, and one or two waterway bills are said by their sponsors to be for the purpose of bringing about reductions in rail rates.

There are eight bills to repeal section 15-a of the interstate commerce act, which contains the general rate-making rule directing the Interstate Commerce Commission, in its regulation of rates, to try to allow the railroads "as nearly as may be" a fair return. These were introduced by Senators Capper, Brookhart, Fletcher, Gooding and Representatives Graham, Tillman, Shallenberger and Huddleston. Four other bills, introduced by Representative Vinson, Senator La Follette, Representative Newton and Senator Howell would also have the effect of repealing section 15-a.

Aside from the surcharge and mileage book bills there are also four bills to directly reduce rates by specific amounts or to re-establish the rates in force at a given date and four bills or resolutions directing the Interstate Commerce Commission to readjust rates. There are two bills to reduce fares for a particular class of persons, one for veterans and one for blind persons.

One of the interesting developments during this session and the last session of Congress has been the introduction of bills to regulate rates by direct legislative action or to give specific instructions to the Interstate Commerce Commission as to how it shall regulate or adjust rates.

Representative Vinson of Georgia introduced a bill to amend section 15-a by providing that rates, fares and charges shall not exceed those in force on February 28, 1920, when the railroads were returned from federal control. Senator Gooding of Idaho introduced a bill providing for a reduction of 33⅓ per cent in freight rates on products of agriculture and livestock. Representative Huddleston has a bill which would make unlawful all rates, fares or charges greater than those in force on August 25, 1920, just prior to the general increases authorized by the Interstate Commerce Commission. Senator La Follette introduced early in the session a resolution directing the commission to "forthwith reduce substantially to the pre-war levels" freight rates upon agricultural products including livestock and upon the materials and implements required upon American farms for the production of agricultural products.

Entirely new systems of rate-making and valuation are

proposed in bills introduced by Senators La Follette, Brookhart and Dill, while a duplicate of the La Follette bill has been introduced in the House by Representative Huddleston. Representative Newton of Minnesota has also introduced a bill to amend section 15-a to provide merely for the opportunity to earn a fair rate of return on the valuation without any provision for any specific percentage. Senator Howell proposed to "re-establish competition in railroad transportation rates as substantially in effect prior to the present increased railway rates and the enactment of the transportation act," by limiting the powers of the Interstate Commerce Commission to establishing and prescribing maximum rates only, with certain exceptions.

In addition to a resolution proposed by Senator Trammell of Florida providing for an investigation of rates with a view to bringing about a substantial reduction, two resolutions have been proposed and given serious consideration in committee to direct the Interstate Commerce Commission to readjust rates. Representative Hoch in December introduced a resolution directing the commission to "take action relative to adjustments in the railroad freight rates structure." Later he introduced another one in more specific language but leaving out the direction to act "forthwith" which provides for a general investigation of the rate structure by the commission with due regard to other investigations or pending proceedings, and directs the commission to make changes to correct defects in the present rate structure "giving due regard among other factors to the general and comparative levels in market value of the various kinds and classes of commodities" as well as to the "natural and proper development of the country as a whole" and to the "maintenance of an adequate system of transportation." The Senate committee on interstate and foreign commerce has also reported out a resolution introduced by Senator Smith of South Carolina declaring agriculture to be "the basic industry of the country and directing the Interstate Commerce Commission to effect such lawful changes in the rate structure as will promote the freedom of movement of the products of agriculture at the lowest possible rates."

There are three bills to repeal the transportation act entirely, introduced by Representatives Shallenberger of Nebraska, Hammer of North Carolina and McLaughlin of Nebraska. Representative McLaughlin has also introduced a bill to repeal the interstate commerce act. Representative Morrow of New Mexico would also apparently like to repeal a large part of the interstate commerce act. He introduced a bill to repeal sections 18, 19, 20 and 22 of the transportation act, but as there are no such sections in the transportation act, it is assumed that he refers to the interstate commerce act. The sections referred to include provisions for the salaries of commissioners and expenses of the commission, as well as those relating to the requirement of annual reports and a uniform accounting system and transportation at free or reduced rates.

The next most numerous class of bills is that relating to labor, of which there are 27, although some others of primary interest to labor might perhaps be added to this class. These include 10 bills to repeal the labor provisions of the transportation act or abolish the Labor Board and four to amend the labor provisions. One bill would transfer the powers and duties of the Labor Board to the Interstate Commerce Commission. One bill proposes to establish a federal court of conciliation and three to re-establish a board of mediation and conciliation. These include the Howell-Barkley bill, drafted by the national railroad labor organizations, on which hearings have recently been concluded by the Senate committee on interstate commerce.

There is one anti-strike bill, introduced by Representative Blanton of Texas, and four bills to encourage strikes by regulating the transportation and importation of labor to any point where a labor disturbance or strike is in progress, and to regulate the granting of injunctions in labor disputes. Two bills would require railroad companies to reimburse employees for property losses sustained by moving terminals.

There are five bills relating directly to the valuation of the railroads, including one by Representative Shallenberger of Nebraska to repeal section 19-a of the commerce act and several others to provide an entirely new basis of valuation, such as the bills introduced by Senators Brookhart and Dill. The former, which was originally introduced at the last session, provides that the fair valuation of the property of a carrier shall not exceed the fair market value of the outstanding securities. Senator Dill's bill proposes to make the assessed valuation of carrier property on a 100 per cent basis the controlling factor in rate-making. Senator La Follette's bill provides for the ascertainment of the "prudent investment" as a "rate base" and of additional investments prudently made to be added to make a "present rate base" to be utilized by the commission in the exercise of its rate-making functions. Of course, other bills amending other parts of the act, such as those to repeal or amend section 15-a, would affect the use made of the valuation.

Nine bills are intended to restore the powers of state authorities which were curtailed by the transportation act.

Eight bills propose to amend paragraph 3 of section 16 of the interstate commerce act by extending the period of limitation on suits for overcharges brought by shippers from two to three years.

The bills relating to safety, etc., include one requiring carriers, in addition to filing reports of all accidents, to file monthly reports with the Interstate Commerce Commission of all civil actions for damages on account of injuries resulting from accidents. Five bills would amend the boiler inspection act by increasing the number and salaries of Interstate Commerce Commission locomotive inspectors. One bill, relating to automatic train control introduced by Representative Mead of New York, would direct the Interstate Commerce Commission to report steps taken to enforce its order regarding the installation of automatic train control devices, of which the effective date has not yet been reached. Two bills would amend the safety appliance acts so that they shall not apply to the territory of Hawaii.

Bills to repeal the consolidation provisions of the transportation act have been introduced by Senator Capper and Representative Newton, while Senator Cummins has introduced a bill designed to induce railroads to effect voluntary consolidations. Four bills relate to interlocking directorates.

The list of bills includes one government ownership bill, introduced by Senator Norris of Nebraska, providing for the creation of a corporation to be known as the Federal Transportation Company with authority and a bond issue to acquire, construct and operate and "enjoy" railroads.

The bills classified as miscellaneous cover a wide range. There are two to establish regional commissions, four providing for investigations of "propaganda," although two of these are general and the two applying solely to railroads are two drafts of the same resolution. Two are intended to provide federal legislation against pilfering and one against trespassing. One is Senator Johnson's bill originally introduced at a time of shortage of refrigerator cars in California to prohibit the declaration of dividends without first obtaining a certificate from the Interstate Commerce Commission that the carrier is adequately equipped in all respects to meet the reasonable requirements of the public. There are two or three bills to amend the provisions of the law relating to certificates of public convenience and necessity.

As Congress has been in an investigating mood several resolutions have been introduced to provide for investigations of various phases of railroad activity but none of them have been passed as yet. These include resolutions to investigate rates, one to investigate railroad publicity expenditures and one, by Senator La Follette, to investigate the settlements made by the Railroad Administration of claims arising from the period of federal control.

General News Department

The Senate on April 12 passed the independent offices appropriation bill carrying the appropriations for the Interstate Commerce Commission and the Railroad Labor Board as passed by the House.

A permanent injunction restraining the International-Great Northern from maintaining its general offices and principal shops at any other place than Palestine, Tex., was handed down by a Court of Civil Appeals at Texarkana, Tex., on April 10. The International-Great Northern had planned to move its headquarters to Houston, Tex.

The St. Louis Railway Club on April 11 elected the following officers: President, K. B. Hannigan, assistant freight traffic manager of the Southern; first vice-president, R. C. White, general superintendent of the Missouri Pacific; second vice-president, W. E. Williams, manager of the department of personnel of the Missouri-Kansas-Texas; third vice-president, E. H. Harman, superintendent of the Terminal Railroad Association of St. Louis; secretary-treasurer, B. W. Frauenthal; and members of the executive committee, R. W. Williams and Dickson Fairback.

Reading's Camden Terminal to Be Opened May 14

The Reading will open its new passenger terminal at Camden, N. J., on May 14 and the opening will be celebrated with appropriate ceremony. The company will send out 10,000 invitations in this connection, and will operate special trains from various Jersey coast points to Camden to carry its guests, who will include city and state officers, presidents of chambers of commerce and other prominent citizens.

Fuel Association Convention

The International Railway Fuel Association will hold its convention at the Hotel Sherman, Chicago, on May 26-29. R. H. Aishton, president of the American Railway Association, and Charles Donnelly, president of the Northern Pacific, will address the meeting. The subjects to be discussed will include oil and coal as locomotive fuel; the budget system; fuel losses at locomotive terminals; the mining, preparation and inspection of coal for locomotive fuel; main tracking and its effect on fuel, and the analysis of the report of the United States Coal Commission.

Boston & Maine Employees' Magazine

The Boston & Maine Employees' Magazine, Vol. 1, No. 1, the issue of April, 1924, has been distributed. It is a 24-page publication, 6 in. by 9 in., illustrated, and it carries no advertising. The company's announcement reads in part:

"With this number the Boston & Maine Bulletin, established a year ago, becomes the Boston & Maine Employees' Magazine. The change is not a new departure but a growth. We have no pretentious plans. But there is need of better means of information about the public service in which we are engaged. . . . ."

Moffat Tunnel Commission Granted Right-of-Way Over Public Lands

Tentative approval has been given by Secretary of the Interior Work to the granting of a right-of-way over public lands for the construction of a tunnel through the continental divide between Grand and Gilpin counties, Colorado. The application was filed by the Moffat Tunnel Commission, which plans to build a tunnel approximately 9,200 feet above the sea level, the eastern portal to be located at the most practical site on the eastern slope of the continental divide and near the headwaters of the South Boulder creek, with the western portal to be located at the most practical point on the western slope near the headwaters of the Frazier river. The tunnel and its approaches will be constructed of such size so that it may be used for standard gage railroads, for the transmission of power, for telephone and telegraph lines, for the transportation of water, automobiles, and other vehicles.

Air Brake Association to Broadcast Talk by President at Spring Convention

Arrangements are being made to broadcast a talk by George H. Wood, general air brake instructor of the Atchison, Topeka & Santa Fe and president of the Air Brake Association, during the convention of the association, which will be held at the Mt. Royal Hotel, Montreal, Quebec, May 6 to 9, inclusive. Announcement of the date and hour, and the wave length of the station from which Mr. Wood will broadcast will be made later for the benefit of those members of the association who are unable to attend the convention.

Bills Introduced

Senator Howell on April 10 introduced a bill S. 3070, "to re-establish competition in railroad transportation rates as substantially in effect prior to the present increased railway rates and the enactment of the transportation act of 1920, popularly known as the Esch-Cummins law, by limiting the powers of the Interstate Commerce Commission to establishing and prescribing maximum rates only, with certain exceptions."

Representative Newton on April 12 introduced a bill to postpone until July 1, 1925, the effective date of section 28 of the Merchant Marine act.

Standardization of Paving Brick

The Committee on Simplification of Varieties and Standards of Vitrified Paving Brick has made a further reduction in the recognized types and sizes of vitrified paving brick from six to five. The types and sizes which have finally been recognized by the committee through the process of elimination extending over a period of three years are as follows:

Type	Depth In.	Width In.	Length In.
Plain wire cut brick (vertical fibre)	3	4	8½
	3½	4	8½
Repressed lug brick	4	3½	8½
Wire cut lug brick (Dunn)	3	3½	8½
	4	3½	8½

Special Meeting of the A. R. A.

A special session of the American Railway Association will be held at the Blackstone Hotel Chicago, at 10 a. m. on May 15, to consider the following:

1. Car Service Division report and review of transportation conditions.
2. Report of Transportation Division as to car service rules.
3. Report of Operating Division regarding changes in the standard code of train rules, etc.
4. Majority and minority reports of Mechanical Division in relation to standards for single and double sheath box cars and rules regarding settlement for rebuilt cars.

New York Central Expands Motor Truck Service

Five trucking zones have been established by the New York Central in western New York in which motor trucks now carry l.c.l. freight formerly handled by peddler freight trains. This new service is in addition to the installation last winter by the New York Central of motor trucks to replace local freight trains in the metropolitan area of New York. The five new zones recently created are in and near Syracuse, Newark, N. Y., Rochester,

Medina and Buffalo. Freight is moved by truck from the above mentioned points to various nearby stations, the trucks renewing their loads at the intermediate zone stations.

At Buffalo, 28 tractors, trucks and trailers are employed; at Yonkers from 5 to 7 trucks, and lesser numbers of units at other points. No trucks are owned by the railroad, contracts being made with motor truck haulage companies. Motor trucks now haul freight to Yonkers not only from White Plains and points on the Harlem division, but also from Brooklyn and terminals on lower Manhattan and from points north as far as Croton. The New York Central also operates motor trucks for terminal service to eliminate trap cars at Erie, Pa., Youngstown, Ashtabula, and Cleveland, Ohio. Surveys are now under way which will lead to the replacement of additional local freight trains by motor trucks on other divisions.

Wage Statistics for January

In January, 1924, the number of employees of Class I railroads was the lowest recorded since September, 1922, according to the Interstate Commerce Commission's monthly bulletin of wage statistics. The number reported was 1,749,927, a decrease of 29,589, or 1.7 per cent as compared with the returns for the same month last year. The total compensation decreased $10,501,535, or 4.2 per cent. The difference in the percentage decrease in the number of employees and their compensation was due chiefly to an unusually large number of overtime hours worked in January, 1923. Compared with the preceding month, the reports for January, 1924, show a decrease in employment of 2.4 per cent. The total compensation, however, shows an increase of 2.1 per cent due principally to the fact that the number of working days was greater.

The monthly earnings, by groups, were as follows:

	Employees reported on daily basis		Employees reported on hourly basis	
Group	Jan. 1924	Jan. 1923	Jan. 1924	Jan. 1923
Executive, officials and staff assistants.	$433	$423	....	....
Professional, clerical and general.....	182	178	$124	$122
Maintenance of way and structures...	240	238	90	90
Maintenance of equipment and stores.	244	243	124	132
Transportation (other than train, engine and yard).....	97	96	124	121
Transportation (yardmasters, switch tenders and hostlers).....	253	253	150	153
Transportation (train and engine service)	...	...	192	200

Canada's Premier Holds Out Scant Hope for Toronto Improvements

A large delegation representing the city council, the Board of Trade and the Harbor Board of Toronto went to Ottawa by special train on April 11 to ask the Dominion government to submit to Parliament a measure providing the money to the Canadian National Railways to do its part in carrying out with the Canadian Pacific the railways' share of the agreement of 1913 with the city of Toronto for the construction of a $30,000,000 viaduct from the eastern end of that city to the new Union Station. The delegation, which was headed by the mayor and reinforced by the Toronto members of the House of Commons, was told bluntly by the Prime Minister that nothing could be expected from the government or Parliament this year.

"So far as the government is concerned," said Premier King, "we will see that its contract is fulfilled, but whatever we do we must do in the light of what Parliament will support. I wish that this delegation could address its remarks to Parliament. We know the situation. We are as anxious to see contracts fulfilled as anybody but you have to consider this: That when we go into Parliament we have to ask the men from Quebec and from British Columbia for the money, in addition to the amount spent on Toronto Harbor, when they are denied money for their own constituency requirements, and there are many who will consider twice before they will see their way clear to support the government when it makes a venture of that kind." The Prime Minister stated that the government was battling every inch of the way to get the Canadian National Railways estimates through the House and it had asked for only what was absolutely essential. Previous governments had not seen fit to do anything, even though they were supported by an entire party representation from Toronto, and the viaduct and other great obligations had been passed on by his predecessors in office. Mayor Hiltz, of Toronto, urged the need of an early start on the work. By the 1913 agreement the viaduct was to have been completed by the railways in three years, but eleven years had passed and there was still no sign of starting. Under prevailing conditions the lives of thousands of Toronto citizens were imperiled by the existing level crossings. An expenditure of $11,000,000 by the Harbor Commission and $3,000,000 on the waterfront might almost as well not have been spent unless the viaduct became a reality.

Chamber of Commerce to Discuss Transportation

The results of the transportation referendum, which will bring to a focus the business opinion of the country on the problems involved in the establishment of a national transportation policy, will be announced at the forthcoming annual meeting of the Chamber of Commerce of the United States, at Cleveland, May 6 to 8.

The referendum report, dealing with a variety of current questions, including railroad consolidation, railroad rate readjustment, terminal consolidation, store-door delivery and co-ordination of rail and water service, will constitute one of the principal topics of discussion at the special transportation group meeting under the auspices of the Department of Transportation of the National Chamber.

Rail and motor transport, the postal service and the merchant marine are all given place on the program for the transportation group meeting, over which Carl R. Gray, president of the Union Pacific, will preside.

Co-operation between shippers and carriers in meeting the fluctuating demands of traffic, an outline of the work of the regional advisory boards of the American Railway Association, will be discussed by H. G. Taylor, president of the National Association of Railroad and Utilities Commissioners. Principles governing the establishment of ocean trade routes and the relation of inland rail rates to ocean transportation also will be given consideration at the group meeting.

Canadian Railway Minister to Present Annual Statement Next Week

The annual statement of the Minister of Railways and Canals will be presented to the House of Commons in the last week of April, according to present plans. This document is unavoidably complicated as that part of it dealing with the operating performance of the Canadian National Railways is for the calendar year, while the financial features of the statement showing to what extent the Dominion government has to provide funds to meet the capital charges of the system and, formerly, to meet much of its operation costs present the government end of the business for the fiscal year ending March 31.

When James A. Robb, Acting Minister of Finance, presented his budget to Parliament last week he pointed out that in the good showing made by the nation's finances in the fiscal year ended March 31 last the operating results of the Canadian National Railways were a considerable factor. They were to the extent of actually $20,236,563.09 of net operating revenue for the calendar year of 1923. Mr. Robb stated that the government was able to reduce the public debt by $30,000,000, so that the Canadian National System contributed over two-thirds of the surplus of the year. This $20,000,000 odd has nothing to do with capital charges. In 1924 Sir Henry Thornton estimates that the system will earn $30,000,000 above operating expenditure. In five years it is expected that the system will earn all of its fixed charges. It is stated that the Canadian National deficits on capital charges accounts are still the most serious obstacle in the way of a pay-as-you-go policy. Although by the help of operating revenues of the system the government was able to cut the public debt by $30,000,000 the indirect obligations of the Canadian taxpayer as guarantor of the system were increased to the extent of $45,000,000. James A. Robb in his budget speech in Parliament last week had the following to say about Canadian National Railways financing:

"Parliament at its last session authorized $74,550,000 for loans to the Canadian National Railways to be made by way of cash or by way of guarantees or partly one way and partly the other. Those alternative provisions for meeting railway obligations as voted by Parliament were first authorized during the session of 1921. In July, 1921, $25,000,000 was raised by way of guarantee for Canadian Northern Railway purposes, and in September, 1921, a further amount of $25,000,000 was raised by way of guarantee

for purposes of the Grand Trunk Railway, making in all $50,000,000 by way of guarantee chargeable against the loan vote of 1921-22. During the next fiscal year, 1922-23, the government was in a position to meet the requirements of the railways by way of loans in cash. During the fiscal year just ended $24,500,000 was paid to the railways by way of cash; we received $768,336 as a refund against the amount advanced in 1921-22 for purchase of rails. The vote for the fiscal year was charged with $24,550,000 and the balance of $50,000,000 was raised in February last by way of guarantee and held by the Minister of Finance in a trust account, payments being made from time to time as necessity arose. I may say that when loans are made by way of cash, under the arrangements made by the former Minister of Finance, they are treated as non-active assets and are therefore not taken into account when determining the net public debt. Moneys raised by way of guarantee, which places the government in the position of endorser, do not presently affect the public debt in any way as they are indirect obligations. The railway issue of February last, guaranteed by the Minister of Finance, was to meet capital charges. A substantial balance is still held in trust by the Minister and will be available for the railways for such purposes during the year 1924-25. Since 1920 the following railway bond issues have been guaranteed by the Minister of Finance under special statutory authority, quite apart from the amounts provided in the annual votes of Parliament for railway purposes: October, 1920, Grand Trunk Railway, $25,000,000; December, 1920, Canadian Northern Railway, $25,000,000; March, 1922, Canadian Northern Railway, $11,000,000; August, 1923, Canadian National Railway, serial equipment issue, $22,500,000. This latter issue is the first equipment issue carrying the government's guarantee. The bonds are secured on the equipment purchased and, in addition, guaranteed under the Guarantee Act of 1923. This was done so as to make the security more attractive to investors and secure the highest price. Previous equipment issues were obligations of the company, specifically secured by the equipment, but without any government guarantee."

Progress on C. N. R. Branch Line Bills

Slow but steady progress has been made in the House of Commons on the Canadian National branch lines program which was submitted to Parliament about three weeks ago by George P. Graham, Minister of Railways and Canals. Of the 26 separate resolutions for as many branch lines there remain only four to be dealt with in the House. These are: Victoria Beach branch in Manitoba, mileage 44, estimated cost $1,100,000; Lockeport branch in Nova Scotia, mileage 4, estimated cost $161,000; China Clay branch, Quebec, mileage 2, estimated cost $105,000; Rosedale branch, Alberta, mileage 39, estimated cost to Canadian National (one-half of total) $915,000. Already one of the measures has reached the second reading stage in the House and after the Easter recess, which is from April 16 to April 22, the other measures will move speedily so that they can be sent to the Senate where they are expected to receive some rough handling by a special committee awaiting them there. That committee intends to summon before it Sir Henry Thornton, president of the Canadian National, to answer questions on oath. The Conservatives are in the majority in the Senate and it is expected that in every case where they have the slightest suspicion that it is not in their political interest to permit the passage of a branch line bill they will throw it out. That has been the policy of the Conservatives in the House of Commons. The opposition which the branch line bills are experiencing in the House of Commons at the hands of the Conservatives has come in for some sharp words from Sir Henry Thornton. In a speech he delivered by radio last week from Montreal, he said: "We have reached that stage in our career in the Canadian National Railways when we may maintain a degree of self-respect. I do not mean egotism. I do not mean pride, but I mean honorable self-respect. There are, unfortunately, those in the land who adopt a policy of assassination of character; character in so far as its officers are concerned. They whisper maliciously and say, 'Well, after all, this net showing of the Canadian National Railways was merely faked; we must not pay much attention to that; it is merely bookkeeping.'

"That is one of the things they started in an effort to detract from what had been done. And a good many things of that kind are going on. I say we are going to challenge statements of that nature. We are going to protect both the company and the officers from slanderous and libelous gossip wherever it appears."

Traffic News

The Missouri Pacific will reduce the running time of the Sunshine Special between Memphis, Tenn., and San Antonio, Tex., 50 min. Under the proposed change it will leave Long View Junction, Tenn., at 10:35 a. m., as at present, and arrive at San Antonio at 9:30 p. m., on the following day instead of 10:20 p. m. Returning, the train will leave San Antonio at 9 a. m. instead of 8:05 a. m., and will arrive at Long View Junction at 1:20 p. m., on the following day as at present.

Freight Tonnage in Canada in 1923

During the calendar year 1923 the Canadian railways carried 103,757,559 tons of revenue freight, of which 68,962,401 tons were loaded at stations in Canada, 20,188,279 tons were received from foreign connections destined to Canadian points and 14,606,879 tons received from foreign connections destined to foreign points. Of agricultural products 21,559,698 tons were loaded at stations in Canada, 896,551 tons received from foreign connections for Canadian points and 3,038,590 tons from foreign connections destined to foreign points. Of animal products 1,639,917 tons were loaded at stations in Canada, 320,080 tons from foreign connections for Canadian points and 1,415,356 from foreign connections for foreign points. Of mine products 17,778,017 tons were loaded at stations in Canada, 15,329,355 tons received from foreign connections destined to Canadian points and 2,986,904 tons from foreign connections for foreign points. Of forest products 13,130,701 tons were loaded at stations in Canada, 465,733 tons were received from foreign connections for Canadian points and 996,524 from foreign connections for foreign points. Of manufactures and miscellaneous 14,854,068 tons were loaded at stations in Canada, 3,176,560 tons from foreign connections for Canadian points and 6,169,505 from foreign connections for foreign points. There was an increase of 14,902,759 tons over the total revenue freight carried by Canadian railways in 1922.

Freight Traffic in February

Two new records were established by the Class I railroads in the handling of freight during February, according to reports filed with the Bureau of Railway Economics. They handled the greatest volume of freight traffic, measured in net ton miles, carried during any February in history, and the average daily movement per freight car for the month amounted to 27.4 miles per day, the highest for any February on record.

Freight traffic in February amounted to 35,962,421,000 net ton miles, an increase of 3,332,065,000 or 10.2 per cent over the same month last year, and an increase of 3,010,289,000 net ton miles or 9.1 per cent over February, 1920. Compared with 1922, this was an increase of 7,511,508,000 net ton miles or 26.4 per cent.

In the Eastern District freight traffic totaled 18,653,492,000 net ton miles, an increase of 12.1 per cent over February last year, while in the Southern district it totaled 5,139,795,000 net ton miles, or an increase of 8.7 per cent. The reports also showed 12,169,134,000 net ton miles in the Western district, an increase of 8.1 per cent over February, 1923.

For the months of January and February, freight traffic amounted to 70,463,134,000 net ton miles, the greatest volume ever handled by the railroads during the first two months in any year. This exceeded the corresponding period last year, which had marked the previous record, by 123,489,000 net ton miles or one-fifth of one per cent.

In attaining a daily average movement of 27.4 miles per freight car, the railroads of the country in February exceeded the same month last year by 2.6 miles, and February, 1920, by 5.1 miles. The average also exceeded that for January this year by 2.4 miles.

The average load per freight car in February was 27.6 tons, a decrease of three-fifths of a ton compared with the same month last year, and seven-tenths of a ton as compared with February, 1920.

Despite the decrease in the average load per car the railroads attained an average of 502 ton miles per car day as compared with an average of 474 in February, 1923.

Equipment and Supplies

C. & O. Places Large Order for Equipment

W. J. Harahan, president of the Chesapeake & Ohio, announced, following a meeting of the directors held at Cleveland, Ohio, on April 15, that the company had ordered $28,000,000 worth of equipment, the largest single order ever placed by the railroad in its history.

The new equipment will include 5,500 hopper cars, 2,000 automobile box cars, 600 ballast cars, 100 caboose cars, 15 express and 5 dining cars and 100 locomotives.

The order for the 2,000 box cars has been divided between the Pullman Company and the Illinois Car Company. Details concerning the allocation of the other orders are not available at the time of going to press. It is understood that the orders for the other cars are to be placed with the American Car & Foundry Company, the General American Car Company, the Standard Steel Car Company and the Newport News Shipbuilding & Drydock Company.

Locomotives

THE PACIFIC ELECTRIC will build 5 direct current 600-1200 volt electric locomotives in its own shops.

THE PENNSYLVANIA has issued orders for the construction of 50 G-5s suburban type ten-wheel passenger locomotives in its Altoona shops.

THE EL PASO & SOUTHWESTERN, reported in the *Railway Age* of March 22 as inquiring for 6 Mountain type locomotives, has ordered this equipment from the American Locomotive Company.

Freight Cars

THE WESTERN ELECTRIC is inquiring for prices on a number of special flat cars.

THE BANGOR & AROOSTOOK is inquiring for 75 steel underframe flat cars of 40 tons' capacity.

THE FLORIDA EAST COAST is inquiring for 500 40-ton box cars, 250 gondola cars and 20 caboose cars.

THE URUGUAYAN STATE RAILWAYS are inquiring through the car builders for 40 low-side gondola cars of 33 tons' capacity.

PICKANDS MATHER & COMPANY, Cleveland, Ohio, has ordered 42 air dump cars of 20 cu. yd. capacity from the Magor Car Corporation.

THE FLORIDA EAST COAST is inquiring for 200 ventilated 40-ton box cars, 200, 40-ton flat-bottom, wooden gondola cars, and 20, 30-ton caboose cars.

THE MISSOURI PACIFIC has placed an order for the repair of 600 box cars with the Sheffield Car & Equipment Company, Kansas City, Mo., instead of the Sheffield Car Company, Three Rivers, Mich., as reported in the *Railway Age* of April 12.

Passenger Cars

THE FLORIDA EAST COAST is inquiring for three 70-ft. coaches.

THE BOSTON & MAINE has purchased one passenger and baggage gasoline car from J. G. Brill Company.

THE PENNSYLVANIA has ordered 12 standard all-steel dining cars to be built at its own shops at Altoona, Pa.

THE DULUTH, MISSABE & NORTHERN has ordered one Oneida motorized car from the Oneida Manufacturing Company.

THE NEW YORK CENTRAL has placed an order with the American Car & Foundry Company for 10 steel passenger train cars.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS, reported in the *Railway Age* of March 1 as inquiring for 4 baggage cars, 3 passenger cars, and 1 dining car, will ask for new bids on this equipment.

THE NORTHERN PACIFIC, reported in the *Railway Age* of February 23 as inquiring for 10 steel baggage cars, has ordered this equipment from the Pullman Company.

THE CANADIAN NATIONAL has ordered through the International Equipment Company, Ltd., Montreal representative of the Railway Storage Battery Car Company, New York, 2 of its 55 ft. steel combination passenger smoking and baggage cars to be equipped with Edison batteries, General Electric motors and control, and Westinghouse air brake equipment.

Machinery and Tools

THE ERIE is inquiring for one 150-ton wrecking crane.

THE GREAT NORTHERN is inquiring for one 30-ton locomotive crane.

THE PENNSYLVANIA installed an Industrial locomotive crane at Altoona, Pa., recently.

THE MERCHANTS DISPATCH has ordered one 30-ton locomotive crane from the Industrial Works.

THE CENTRAL OF GEORGIA has ordered one, five-ton jib crane of 25 ft. radius from the Whiting Corporation.

THE DETROIT TERMINAL has ordered one 200-ton four-jack locomotive hoist from the Whiting Corporation.

THE BOSTON & MAINE is inquiring for 2 car wheel boring machines, 2 axle lathes and 2 car wheel presses.

THE SOUTHERN has ordered one 250-ton transfer table for use at Findlay, Ga., from the Whiting Corporation.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for one motor-driven drill press and one belt-driven engine lathe.

THE NORFOLK & WESTERN has ordered one 10-ton three-motor crane with a 69-ft. span from the Whiting Corporation.

THE TOLEDO, ST. LOUIS & WESTERN has ordered one 200-ton four-jack locomotive hoist from the Whiting Corporation.

THE ATCHISON, TOPEKA & SANTA FE has ordered one 15-ton electric traveling crane from the Shaw Electric Crane Company.

Iron and Steel

THE CANADIAN PACIFIC has given an additional order to the Algoma Steel Corporation for 26,000 tons of 100-lb. rail.

THE WABASH has ordered from the Mississippi Structural Steel Company, 400 tons of structural steel for a coach shop at Decatur, Ill.

THE FLORIDA EAST COAST, reported in the *Railway Age* of February 9 as inquiring for steel to be used for a bridge over the St. Johns river between Jacksonville, Fla., and South Jacksonville, has ordered about 5,500 tons of steel for this work from the Phoenix Bridge Company.

Track Specialties

THE GREAT NORTHERN is inquiring for 2,000 tons of tie plates.

A MEETING of the Philadelphia Section of the American Institute of Electrical Engineers was held at the Bellevue-Stratford Hotel on April 14. J. V. B. Duer, electrical engineer of the motive power department of the Pennsylvania Railroad, presented a paper entitled, "Railroad Electrification, Its Present Developments and Future." A very large part of the paper was historical. The reasons for the adoption of electric motive power in the various instances were pointed out and the well-known advantages and disadvantages were rehearsed.

Supply Trade News

The **American Steel Foundries** has moved its Chicago offices to 410 North Michigan avenue.

The **Truscon Steel Company** has extended the territory of its San Francisco office to include the Hawaiian Islands.

The **Griffin Wheel Company** has removed its Chicago office from 332 South Michigan avenue to 410 North Michigan avenue.

Willis C. Lincoln has been appointed Western sales manager of the **Electric Service Supplies Company,** with headquarters in Chicago and has resigned as manager of sales and engineering for the National Railway Appliance Company, New York. After leaving High School Mr. Lincoln was employed as locomotive fireman on the Delaware & Hudson and later as a machinist with the American Locomotive Company. Shortly thereafter he became Pennsylvania representative for the Brewer-Pryor Piano Company, and two years later he entered Union University where he specialized in electrical engineering. After completing this course, Mr. Lincoln entered the regular test course in the General Electric Company's Schenectady plant. Completing this, he was connected first with the consulting engineering department and then with the railway engineering department. From this work he transferred to the Philadelphia district where he served for several years as sales engineer in the railway department. During the period of the war Mr. Lincoln was in charge of the engineering department of the Railway Improvement Company, New York. For the past five years he has been with the National Railway Appliance Company, in charge of marketing throughout the country of various lines of equipment for steam and electric railroads, public utilities and some mines and industrial concerns.

W. C. Lincoln

The **Union Tank Car Company,** New York, will, on May 15, establish an office in the McCormick Building, 332 South Michigan avenue, Chicago.

The referee in bankruptcy for the Eastern district of Missouri has ordered the sale of 406 steel tank cars which were the property of the Indiahoma Refining Company, St. Louis, Mo.

Locomotive Shipments in March

The Department of Commerce has prepared the following table of shipments of locomotives in March. This report covers the principal manufacturing plants and is based on reports received from the individual establishments. The table gives the shipments of locomotives in March and unfilled orders as of March 31, with comparisons for earlier months.

LOCOMOTIVES

Year and month	Shipments			Unfilled orders		
	Total	Domestic	Foreign	Total	Domestic	Foreign
1923						
January	229	217	12	1,788	1,699	89
February	207	196	11	2,220	2,141	79
March	282	269	13	2,316	2,214	102
April	217	201	16	2,204	2,111	93
May	238	228	10	2,150	2,045	105
June	232	221	11	1,958	1,854	104
July	239	211	28	1,738	1,652	86
August	272	259	13	1,497	1,406	91
September	335	313	22	1,178	1,102	76
October	310	295	15	977	915	62
November	299	270	29	691	656	35
December	329	305	24	387	365	22
1924						
January	151	147	4	376	344	32
February	99	92	7	499	466	33
March	132	128	4	534	494	40

Buda Company

The annual report of the Buda Company, Chicago, for 1923, shows net shipments of $6,255,405 comparing with $4,178,402 in 1922. The net earnings after all deductions amounted to $433,971, compared with $179,120 last year. After the payment of dividends there was a surplus of $234,242. The income account and balance sheet for the year ended December 31, 1923, is as follows:

	1923	1922
Net shipments	$6,255,405	$4,178,402
Cost of sales	5,568,095	3,985,060
Manufacturing profit	687,310	193,342
Other income	29,051	25,408
Total income	716,361	218,750
Interest, discount, etc.	282,390	39,630
Net earnings	433,971	179,120
Dividends paid	199,729	72,277
Surplus	234,242	106,843

ASSETS

	1923	1922
Plant equipment	$1,274,136	$1,551,571
Cash and government securities	599,524	498,445
Accounts and bills receivable	675,635	735,327
Treasury stock (preferred)	.....	124,100
Inventories	2,168,112	1,898,640
Deferred assets	162,937	186,988
Total assets	$4,880,344	$4,995,071

LIABILITIES

Capital stock	$2,626,033	$2,844,333
Accounts payable and commercial paper	958,616	269,913
Reserves (current)	136,580	16,895
Reserves (contingent)	100,000	.....
Surplus	1,059,115	863,930
Total liabilities	$4,880,344	$4,995,071

Obituary

John H. Lord, of Joseph T. Ryerson & Son, Inc., Chicago, died on March 30 at Louisville, Ky.

LOCOMOTIVES ORDERED, INSTALLED AND RETIRED

Month	Domestic[1] orders reported during mo.	Installed[2] during month	Aggregate tractive effort	Retired during month	Aggregate tractive effort	Owned at end of month	Aggregate tractive effort	On order first of following month	Building in R. R. Shops
September	8	384	22,342,517	260	7,191,302	64,720	2,506,469,051	1,242	7
October	50	408	21,665,487	301	7,935,709	64,827	2,520,200,846	942	15
November	49	333	19,054,713	282	7,741,395	64,879	2,532,085,380	739	14
December	12	333	18,260,423	316	8,738,378	64,896	2,541,607,425	510	14
Full year, 1923, 1924	1,984*	4,037*	.....	3,672	.....	.....	.....	...	..
January	125	271	15,228,895	178	4,447,721	64,989	2,552,694,953	439	14
February	85	214	11,296,088	175	4,906,435	65,029	2,559,519,253	457	10
March	283	...	.....	...	.....	.....	.....	...	..
Total for 2 months	...	485	.....	353	.....	.....	.....	...	..
Total for 3 months	493	...	.....	...	.....	.....	.....	...	..

[1] Details as to orders from *Railway Age* weekly reports. Figures include all domestic orders placed with builders and railroad shops, but not rebuilt equipment.

[2] Figures as to installations and retirements prepared by Car Service Division, A. R. A., published in form C. S. 56A-1. Figures cover only those roads reporting to the Car Service Division. They include equipment received from builders and railroad shops. Figures of installations and retirements alike include also equipment rebuilt to an extent sufficiently so that under the accounting rules it must be retired and entered in the equipment statement as new equipment. Figure as to orders as given in first column of table is not therefore comparable with figures relating to installations given in succeeding columns.

* Corrected figure.

Railway Construction

CENTRAL OF GEORGIA.—This company will build a new station at Opelika, Ala., at an approximate cost of $75,000.

DULUTH, MISSABE & NORTHERN.—This company has awarded a contract to the Mead Morrison Manufacturing Company, Chicago, for the erection of a coal handling bridge on the property of the St. Louis Bay Coal Dock Company in Duluth, Minn. The contract for the fabrication of steel has been awarded to the American Bridge Company and the contract for the electrical equipment has been awarded to the General Electric Company.

GREAT NORTHERN.—This company is considering the construction of an enginehouse at Hillyard, Wash., but will not begin construction this year.

GREAT NORTHERN.—This company will construct with company forces one 70-ft. and two 40-ft. deck girder spans, with concrete piers, at Mason, N. Dak.

JACKSON & EASTERN.—This company has started work on a 15-mile extension to its line.

MAINE CENTRAL.—This company closed bids on April 5 for the construction of a 4-stall engine house at Bingham, Me., to cost approximately $26,000. The company has awarded contracts to the American Bridge Company for the construction of two bridges—one at Waterville, Me., 4-span, to cost approximately $185,000 and another, 2-span, at Lewiston, to cost approximately $85,000.

MISSOURI PACIFIC.—This company has awarded a contract to the Railroad Water & Coal Handling Company, Chicago, for the laying of 2,800 ft. of 10-in. cast iron pipe at Texarkana, Ark., instead of to Joseph E. Nelson & Sons, Chicago, as reported in the *Railway Age* of April 12.

NEW YORK CENTRAL.—This company plans the construction of a concrete subway under its two tracks and the two tracks of the Pennsylvania at Center street, Ashtabula, Ohio. The date for the calling for bids has not been set.

NORTH & SOUTH.—The Interstate Commerce Commission has issued a certificate authorizing the construction of a line from Miles City, Mont., in a general southerly direction to Casper, Wyo., approximately 332 miles, and the acquisition and operation as part of the road of any line or lines now wholly or in part constructed over the proposed route. Prior to its organization the promoters of the present company had incorporated the Montana Railway to build from Miles City to the Montana-Wyoming state line, and also the Wyoming North & South to build from the state line south to Casper, and considerable construction work has been done under the two intrastate charters. Between Salt Creek and Illco, 41 miles, the line has been completed and placed in operation. It is also proposed to use some trackage right over other lines. The cost of construction, without equipment, is estimated at $11,112,020.

PENNSYLVANIA.—This company plans the construction of a cut-off from Louisville, Ohio, to East Rochester, a distance of 15 miles.

PENNSYLVANIA.—This company is reported to be planning the construction of a 900-ft. steel trestle and concrete retaining wall in Cleveland, Ohio.

PRESCOTT & NORTHWESTERN.—This company will soon call for bids for the construction of a 26-mile extension from Prescott, Ark., into Nevada county, reported in the *Railway Age* of March 22.

READING.—This company has awarded a contract for the construction of the substructure of a highway bridge at Allentown, Pa., to the Bennett-Randall Company, Lebanon, Pa., and for the superstructure to the American Bridge Company. A contract for the substructure of a highway bridge at Tuckerton, Pa., has been awarded to the Bennett-Randall Company and for the superstructure to the Shoemaker Bridge Company, Philadelphia.

RICHMOND, FREDERICKSBURG & POTOMAC.—This company has revised its plans for the reconstruction of its bridge over Neabsco creek. The structure is now a timber trestle. It will be replaced by a structure having steel bents, concrete sills and a solid concrete slab floor. Steel work will total about 1,000 tons for the fabrication and erection of which a contract has been given to the American Bridge Company. The concrete work will be done by company forces. The total cost of the work will be approximately $180,000.

SOUTHERN.—This company has authorized the construction of new passing and storage tracks and extensions to existing tracks at the following points: Air Line Junction Yard, Charlotte, N. C.; Spencer, N. C.; Calverton, Va.; Nokesville, Va.; Weyburn, Va.; Culpeper, Va.; Shipman, Va.; South Richmond, Va.; Durmid, Va.; Pomona, N. C.; Reidsville, N. C.; China Grove, N. C.; Glass, N. C.; Hahn, N. C.; Gastonia, N. C.; Cramerton, N. C.; Bessemer City, N. C.; Elmwood, N. C.; Swannanoa, N. C.; Old Fort, N. C.; Morganton, N. C.; Connelly Springs, N. C.; Saluda, N. C.; Landrum, S. C.; Campobello, S. C.; Volga, N. C.; Sandy Bottom, N. C.; Addie, N. C.; Hanes, N. C.; Barber, N. C.; Crutchfield, N. C.; Mt. Ulla, N. C.; Davidson, N. C.; Taylorsville, N. C.; Chester, S. C.; Rock Hill, S. C.; Blackstock, S. C.; Lena, S. C.; Loyall, Tenn.; Germantown, Tenn.; Burnsville, Miss.; Hillsboro, Ala.; Rossville, Tenn.; Middletown, Tenn.; Irvington, Ala.; Madison, Ala.; Gurley, Ala.; Hollywood, Ala.; Fackler, Ala.; DeArmanville, Ala.; Tarsus, Ala.; Hooper, Ga.; Weems, Brompton, and Bynum, Ala.; Doubling and Lithia Springs, Ga.; Cook's Springs, Ala.; Bains, Ala.; Roberts, Ala.; Morgan, Ga.; Riverside, Ala.; Waco, Ga.; Jacksboro Yard, Knoxville, Tenn.; Volga, N. C.; Telford, Tenn.; Concord, Tenn.; Bearden, Tenn.; Harriman, Tenn.; Clinton, Tenn.; Chestnut Ridge, Tenn.; Tazewell, Tenn.; Maxwell, Tenn.; Luttrell, Tenn.; Williams Springs, Tenn.; Coran, Tenn.; Summit, Tenn.; Princeton, Ind. Short sections of double track will be constructed at Harriman and Loyall. On the Memphis division, 50 miles of track laid with 75-lb. rail will be relaid with 85-lb. The company is installing automatic signals and telephone dispatching circuits between Birmingham, Ala., and Atlanta, Ga.

SOUTHERN.—This company has awarded a contract to the Foundation Company, New York, for the construction of a freight terminal and coaling facilities at Knoxville, Tenn., to cost approximately $3,000,000.

SOUTHERN PACIFIC.—This company plans the reconstruction of its bridge over the Neches river at Beaumont, Texas.

SOUTHERN PACIFIC.—This company will elevate its tracks in the city of Beaumont, Texas, the work to begin this year. The cost of the construction is estimated at $1,272,000.

WABASH.—This company will construct extensions to six existing stalls and an addition of four stalls to the enginehouse at Moulton, Iowa. Plans for the work have not yet been made.

Extending Central Station, Amsterdam, Holland

Railway Financial News

BELT RAILWAY OF CHICAGO.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a net income of $411,727 as compared with $259,530 in 1922. A selection of the principal items in the income account follows:

	1923	1922
Operating revenues	$7,192,498	$6,184,668
Operating expenses	4,588,500	4,093,253
Net revenue from railway operation	2,603,998	2,091,415
Railway tax accruals	476,537	417,596
Railway operating income	2,127,461	1,673,819
Non-operating income	Dr. 57,075	132,475
Gross income	2,070,386	1,806,294
Total deductions	1,658,659	1,546,764
Net income	411,726	259,530
Dividend appropriation of income	173,583	172,800
Income transferred to suspense	238,144	86,730

BOSTON & ALBANY.—*Opposes Claim of N. Y. C.*—At a hearing before the Massachusetts Public Utilities Commission on April 14, Nathan Matthews, counsel for the Boston & Albany, objected to an issue of bonds by that road of more than $3,000,000 to be paid to the New York Central for past expenditures made by the lessee. Mr. Matthews objected on the ground that the New York Central had failed to take care of depreciation to the extent of $2,500,000. He claimed that many of the expenditures which it is proposed to capitalize are of a trivial nature, not likely to last the term of the bonds and some of them already capitalized. The hearing will be continued on April 30.

BOSTON & MAINE.—*Annual Meeting.*—At the annual meeting of the Boston & Maine held in Boston on April 9, the board of directors was increased from 19 to 21 members. Considerable discussion developed at the meeting because of the presence of various groups, these including besides the management, the New York, New Haven & Hartford, the first preferred stockholders, and a group of minority stockholders. The voting of stock by the New York, New Haven & Hartford Railroad marked the return of participation by the New Haven in the activity of the Boston & Maine after a lapse of several years. This participation was made possible by a federal court decree of last June whereby Boston & Maine stock formerly held by trustees was returned to the New Haven's possession. The New Haven now owns about 28 per cent of the Boston & Maine common stock. Directors re-elected totaled 14. They were: Norman L. Bassett, Richard Billings, Charles W. Bosworth, Frank P. Carpenter, Charles Sumner Cook, Harry H. Dudley, Ernest Martin Hopkins, James H. Hustis, Alba M. Ide, George von L. Meyer, Walter M. Parker, Harry G. Stoddard, J. Duncan Upham, William D. Woolson. New directors elected were: George L. Batchelder, W. C. Baylies, T. Jefferson Coolidge, Louis K. Liggett, Homer Loring, W. Rodman Peabody and Thomas Nelson Perkins. Three directors whom the Boston & Maine management sought to re-elect were defeated. These were Henry B. Day, George R. Wallace and Henry E. Warner. Vice-presidents Woodward Hudson and William J. Hobbs, who have been serving temporarily on the board, retired. The preferred stockholders' "voting trust" elected all of its candidates. The Boston & Maine management was in agreement with the New Haven on Messrs. Baylies, Liggett, Perkins and Bassett to represent the New Haven holdings, all of whom were elected. The meeting had a voting strength of 647,665 shares; the preferred stockholders' "voting trust" had 182,758; the Boston & Maine management had 154,536, the New Haven, 229,883 and the minority stockholders only 30,500. A resolution against consolidation of the Boston & Maine with the New York, New Haven & Hartford Railroad, offered at the request of the minority common stockholders, was defeated by a vote of 255,240 to 245,642.

CANADIAN PACIFIC.—*Bonds Sold.*—A syndicate headed by the Bank of Montreal has sold $12,000,000 ten-year 5 per cent collateral trust bonds at 98.85, to yield 5.15 per cent. These bonds, payable in Canada only, are secured by $15,000,000 of 4 per cent debenture stock. This is the first financing the Canadian Pacific has done in Canada since 1913, when $52,000,000 of notes maturing in 1923 were sold.

CHICAGO & NORTH WESTERN.—*Director Elected.*—Fred W. Sargent, vice-president and general counsel has been elected a director.

CHICAGO GREAT WESTERN.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a net income of $570,767 as compared with $432,770 in 1922. A summary of the company's income for 1922 and 1923 follows:

	1923	1922	Increase or Decrease
Railway operating revenues	$25,724,707	$24,224,789	$1,498,918
Railway operating expenses	21,431,016	21,274,235	156,781
Revenues over expenses	4,292,691	2,950,554	1,342,137
Taxes	856,144	985,700	—129,556
Uncollectible railway revenues	3,330	2,954	377
Railway operating income	3,433,216	1,961,900	1,471,316
Equipment rents—Net debit	493,488	894,769	—401,280
Joint facility rents—Net debit	821,055	801,944	19,111
Net railway operating income	2,118,672	265,187	1,853,486
Other income	266,888	1,957,141	—1,690,253
Gross income	2,385,561	2,222,328	163,232
Deductions:			
Interest on funded debt	1,674,019	1,242,877	431,143
Interest accrued on bonds of M. C. & Ft. D. R. R. Co.	.....	(a)440,000	—440,000
Other deductions	140,775	106,681	34,093
Total deductions	1,814,794	1,789,558	25,236
Net income (surplus)	570,767	432,770	137,997

Note—(a) This is the amount accrued January to November, inclusive. The Chicago Great Western will acquire the coupons representing all unpaid interest accruing from December 1, 1920, to December 1, 1922, in exchange for its securities.

CHICAGO & WESTERN INDIANA.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a net income of $754,323 as compared with $694,475 in 1922. A selection of the principal items in the income account follows:

	1923	1922
Operating revenues	$376,840	$320,467
Operating expenses	422,616	383,378
Net operating loss	45,775	62,911
Non-operating income	4,567,979	4,487,134
Gross income	4,522,204	4,424,223
Total deductions	3,767,861	3,729,747
Net income	754,343	694,475

CHOWCHILLA PACIFIC.—*Acquisition.*—See Visalia Electric.

DELAWARE, LACKAWANNA & WESTERN.—*Annual Report.*—The annual report, issued this week, shows a surplus of $2,245,069 for the year ended December 31, 1923, as compared with $342,997 in 1922. A selection of the principal items in the income account follows:

	1923	1922	Increase or Decrease
Coal revenues	$25,151,010	$14,294,191	$10,856,819
Freight revenues	39,085,364	37,262,516	1,822,848
Passenger revenues	14,185,914	13,960,681	225,234
Total revenues	88,236,984	74,622,344	13,614,630
Maintenance of way and structures	7,663,064	7,882,540	—219,476
Maintenance of equipment	21,239,075	18,683,608	2,555,467
Traffic	1,308,121	1,349,689	—41,568
Transportation	36,750,177	33,242,097	3,508,080
General	1,853,903	1,872,164	—18,261
Total expenses	69,467,853	63,671,647	5,796,206
Net revenue from operation	18,769,120	10,950,697	7,818,424
Tax accruals	5,995,698	4,894,466	1,101,231
Operating income	12,751,170	6,046,287	6,704,883
Gross income	19,072,466	16,848,062	2,224,405
Total deductions	12,378,001	10,475,929	1,902,073
Dividends declared	10,132,932	10,132,932	.....
Balance, surplus	2,245,069	342,997	1,902,073

DENVER & RIO GRANDE WESTERN.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a net deficit of $2,854,910 as compared with a net deficit of $368,467 in 1922. A selection of the principal items in the income account follows:

	1923	1922	Increase or Decrease
Average mileage operated	2,595	2,593	2
Freight revenues	$25,309,887	$25,036,212	273,675
Passenger revenues	5,789,354	5,585,624	203,730
Total operating revenues	34,587,497	33,350,593	1,236,903
Maintenance of way and structures	5,534,640	4,497,381	537,258
Maintenance of equipment	9,653,292	7,570,119	2,083,173
Traffic	591,502	543,647	47,855
Transportation	12,698,471	11,615,142	1,083,329
General	1,015,083	998,407	16,676
Total operating expenses	30,030,669	26,304,805	3,725,865
Net from operations	4,556,827	7,045,789	—2,488,961
Tax accruals	1,885,130	1,830,015	55,115
Total operating income	2,663,560	5,208,068	—2,544,508
Gross income	5,417,744	7,514,094	—2,096,349
Total deductions	8,272,654	7,882,560	390,094
Net income	Def. 2,854,910	Def. 368,467	—2,486,443
Income applied to sinking fund	261,500	260,962	538
Income applied to redemption of equipment trust series "A"	240,000	.....	240,000
Income balance	Def. 3,356,410	Def. 629,428	—2,726,981

DULUTH, MISSABE & NORTHERN.—*Hearing on Excess Earnings.*—The Interstate Commerce Commission has announced a hearing to be held before Division 4 at Washington on May 7 for the purpose

of receiving evidence regarding the returns made to the commission by the company as to any excess railway operating income subject to recapture under section 15a of the commerce act. The notice says the company reported the value of its property used for transportation purposes for the period March 1, to December 31, 1920, as not less than $118,302,566; for the year 1921 as not less than $120,477,511, and for 1922 as not less than $126,215,752, and that on this basis it had received no excess railway operating income.

GLENMORA & WESTERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line, extending from McNary to Holdup, La., 17 miles.

INTERNATIONAL-GREAT NORTHERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell or pledge $1,809,000 of first mortgage 30-year 6 per cent bonds to reimburse the treasury, to be sold at not less than 90 or pledged as security for short term notes.

LONG ISLAND.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $1,875,000 of 5 per cent equipment trust certificates, sold, subject to the commission's approval, to Kuhn, Loeb & Co., at 97.56.

MINNEAPOLIS & ST. LOUIS.—*Six Months' Guaranty Overpaid.*—The Interstate Commerce Commission has issued a certificate showing the amount of this company's guaranty for the six months' period following the termination of federal control as $2,347,977, and that on this basis the company has been overpaid $292,022 in partial payments and therefore owes this amount to the government.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Annual Report.*—The annual report for 1923, issued this week, shows a net income of $1,628,806 as compared with $1,680,522 in 1922. A selection of the principal items in the income account follows:

	1923	1922
Mileage operated	1,258.49	1,258.54
Freight revenue	$18,027,477	$16,055,719
Passenger revenue	5,060,565	4,678,038
Total operating revenues	24,801,787	22,353,763
Maintenance of way and structures	4,405,882	3,339,580
Maintenance of equipment	5,919,108	5,464,098
Traffic expenses	883,475	818,197
Transportation	9,466,281	8,820,897
General	742,181	708,899
Total operating expenses	21,453,047	19,207,688
Net revenue from railway operations	3,348,740	3,146,075
Railway tax accruals	701,900	420,000
Total operating income	2,642,169	2,709,083
Net railway operating income	3,061,971	3,094,209
Non-operating income	337,482	312,370
Gross income	3,399,454	3,406,579
Total deductions	1,770,648	1,726,057
Net income	1,628,806	1,680,522

NEW YORK CENTRAL.—*B. & A. Opposes Claim.*—See Boston & Albany above.

NEW YORK, ONTARIO & WESTERN.—*Annual Report.*—The annual report for 1923 shows a surplus of $122,785 as compared with a deficit of $748,099 in 1922. The income account compares as follows:

	1923	1922
Operating revenue	$13,937,266	$12,341,912
Operating expenses	12,158,349	10,985,547
Net revenue from railway operation	1,779,017	1,356,365
Tax accruals	408,696	451,801
Uncollectible revenue	1,896	3,484
Operating income	1,368,425	901,080
Non-operating income	536,436	349,269
Gross income	1,904,861	1,250,348
Deductions from gross income	1,782,076	1,998,447
Surplus	122,785	Def. 748,099

PENNSYLVANIA.—*Equipment Trusts Sold.*—Kuhn, Loeb & Co., have sold at 99½, to yield an average of 5.08 per cent, $20,100,000 general equipment trust 5 per cent certificates, series "B," maturing in equal installments from April 1, 1925, to 1939, inclusive. The certificates will be secured by standard equipment, costing approximately $25,325,000 and comprising 8,000 steel box cars, 3,000 steel automobile cars and 1,000 steel stock cars.

PENNSYLVANIA.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $20,100,000 of 5 per cent equipment trust certificates, sold, subject to the approval of the commission, to Kuhn, Loeb & Co., at 97.56.

RUTLAND.—*New Director.*—P. E. Crowley, president of the New York Central, has been elected a director succeeding A. H. Smith, deceased.

SOUTHERN PACIFIC.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon 6.21 miles of tracks in the city of Los Angeles, Cal.

ST. LOUIS SOUTHWESTERN.—*Authorized to Acquire Line.*—This company has been authorized by the Interstate Commerce Commission to acquire control of the Stephenville North & South Texas by lease.

STEPHENVILLE NORTH & SOUTH TEXAS.—*Acquisition.*—See St. Louis Southwestern.

STEWARTSTOWN.—*Asks Authority to Acquire Line.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the New Park & Fawn Grove.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*New Directors.*—At a meeting of the stockholders in St. Louis on April 14, H. B. Voorhees, general manager of the Baltimore & Ohio, Western Lines, and L. C. Fritch, vice-president of the Chicago, Rock Island & Pacific, were elected directors to succeed R. N. Begien and T. H. Beacon, respectively.

UNION PACIFIC.—*Annual Report.*—This company's annual report for 1923 is reviewed in an article on another page of this issue entitled "Union Pacific Pays Fixed Charges from Investments." See also excerpts from annual report on adjacent pages.

VISALIA ELECTRIC.—*Acquisition.*—This company has been authorized by the Interstate Commerce Commission to acquire and operate the Chowchilla Pacific, from Chowchilla to Dairyland, Calif., 11.68 miles.

WABASH.—*Annual Report.*—The annual report for the year ended December 31, 1923, issued this week shows a net income of $5,410,874 as compared with $1,210,388 in 1922. A selection of the principal items in the income account follows:

	1923	1922	Increase or Decrease
Average mileage operated	2,477	2,473	4
Freight revenue	$51,698,168	$43,911,074	$7,787,094
Passenger revenue	9,794,594	9,087,894	706,700
Total operating revenues	66,617,636	57,662,496	8,955,140
Maintenance of way and structures	9,501,515	8,270,927	1,230,588
Maintenance of equipment	13,884,271	12,282,949	1,601,322
Traffic	1,518,004	1,378,262	139,742
Transportation	24,997,689	24,086,905	910,784
General	1,864,185	1,775,867	88,318
Total operating expenses	52,033,495	48,041,297	3,992,197
Net operating revenue	14,584,142	9,621,199	4,962,943
Railway tax accruals	2,470,800	2,262,675	208,125
Total operating income	12,579,283	7,670,412	4,908,870
Net operating income	8,941,275	4,107,421	4,833,855
Toatl non-operating income	716,747	1,165,159	—448,412
Gross income	9,658,022	5,272,580	4,385,442
Total deductions from gross income	4,247,148	4,062,192	184,956
Net income	5,410,874	1,210,388	4,200,486

Trend of Railway Stock and Bond Prices

	April 15	Last Week	Last Year
Average price of 20 representative railway stocks	62.50	63.95	66.83
Average price of 20 representative railway bonds	85.20	85.98	82.83

READING COMPANY.—*Bond Exchange Offer.*—The United States District Court in Philadelphia has issued an order to the Reading Company and the Philadelphia & Reading Coal & Iron Company to keep open the offer of exchange for general mortgage bonds until October 10, 1924.

Dividends Declared

Alabama & Vicksburg.—3½ per cent, semi-annually, payable April 16 to holders of record April 1.

Chicago & Western Indiana.—1½ per cent, quarterly, payable April 1.

Vicksburg, Shreveport & Pacific.—Common, 4 per cent; preferred, 2½ per cent, semi-annually; both payable April 16 to holders of record April 4.

Annual Report

Union Pacific System

REPORT OF THE BOARD OF DIRECTORS

NEW YORK, N. Y., April 1, 1924.

TO THE STOCKHOLDERS, UNION PACIFIC RAILROAD COMPANY:

The Board of Directors submits the following report of the operations and affairs of the Union Pacific Railroad Company for the calendar year ended December 31, 1923, *including* the Oregon Short Line Railroad Company, whose entire Capital Stock is owned by the Union Pacific Railroad Company, the Oregon-Washington Railroad & Navigation Company, whose entire Capital Stock (except fifteen qualifying shares held by Directors) is owned by the Oregon Short Line Railroad Company, and the Los Angeles & Salt Lake Railroad Company, whose entire Capital Stock is owned, one-half each, by the Union Pacific Railroad Company and the Oregon Short Line Railroad Company. For convenience, the four companies are designated by the term "UNION PACIFIC SYSTEM."

INCOME STATEMENT

The income for the calendar year 1923, compared with the calendar year 1922, *after excluding all offsetting accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Company*, was as follows:

	Calendar Year 1923	Calendar Year 1922	Increase	Decrease
Transportation Operations—				
Operating Revenues	$211,318,465.31	$192,877,121.66	$18,441,343.65	.....
Operating Expenses	152,249,080.27	143,846,229.34	8,402,850.93	.....
Revenues over Expenses	$59,069,385.04	$49,030,892.32	$10,038,492.72	.....
Taxes	13,573,066.63	13,251,551.42	321,515.21	.....
Uncollectible Railway Revenues	21,783.69	13,274.18	8,509.51	.....
Railway Operating Income	$45,474,534.72	$35,766,066.72	$9,708,468.00	.....
Rents from use of joint tracks, yards and terminal facilities	1,262,890.88	1,208,517.49	54,373.39	.....
	$46,737,425.60	$36,974,584.21	$9,762,841.39	.....
Hire of equipment—debit balance	$4,938,151.82	$1,560,814.74	$3,377,337.08	.....
Rents for use of joint tracks, yards and terminal facilities	2,139,028.25	1,917,451.54	221,576.71	.....
	$7,077,180.07	$3,478,266.28	$3,598,913.79	.....
Net Income from Transportation Operation	$39,660,245.53	$33,496,317.93	$6,163,927.60	.....
Income from Investment and Sources other than Transportation Operations—				
Dividends on stocks owned	$9,473,676.25	$7,888,049.00	$1,585,627.25	.....
Interest on bonds, notes and equipment trust certificates owned	6,008,540.75	6,156,427.44	.....	$147,886.69
Interest on loans and open accounts—balance	642,739.35	1,042,910.98	.....	400,171.63
Rents from lease of road	239,162.07	71,685.90	167,476.17	.....
Miscellaneous rents	430,573.40	350,036.08	80,537.32	.....
Miscellaneous income	718,874.79	240,453.17	478,421.62	.....
Total	$17,513,566.61	$15,749,562.57	$1,764,004.04	.....
Total Income	$57,173,812.14	$49,245,880.50	$7,927,931.64	.....
Fixed and Other Charges—				
Interest on Funded Debt	$16,879,476.71	$16,430,876.67	$448,600.04	.....
Miscellaneous rents	49,191.06	47,420.79	1,770.27	.....
Miscellaneous charges	322,938.50	427,859.79	.....	$104,921.29
Total	$17,251,606.27	$16,906,157.25	$345,449.02	.....
Net Income from all Sources	$39,922,205.87	$32,339,723.25	$7,582,482.62	.....

DISPOSITION OF NET INCOME.

Dividends on Stock of Union Pacific Railroad Co.:					
Preferred stock—					
2 per cent paid April 2, 1923	$1,990,870.00				
2 per cent paid October 1, 1923	1,990,870.00	$3,981,740.00	$3,981,740.00	.....	.....
Common stock—					
2½ per cent paid April 2, 1923	$5,557,290.00	.....	.....	.....	.....
2½ per cent paid July 2, 1923	5,557,290.00	.....	.....	.....	.....
2½ per cent paid October 1, 1923	5,557,290.00	.....	.....	.....	.....
2½ per cent payable January 2, 1924	5,557,290.00	22,229,160.00	22,229,160.00	.....	.....
Total Dividends		$26,210,900.00	$26,210,900.00	.....	.....
Sinking Fund Requirements		18,736.66	9,416.66	$9,320.00	.....
Total Appropriations of Net Income		$26,229,636.66	$26,220,316.66	$9,320.00	.....
Surplus, Transferred to Profit and Loss		$13,692,569.21	$6,119,406.59	$7,573,162.62	.....

The "Net Income from All Sources" for the calendar year 1923, less sinking fund requirements and dividends on the preferred stock, amounted to $35,921,729.21 and is equivalent to 16.16 per cent on the $222,291,600 common stock of the Union Pacific Railroad Company outstanding, as compared with 12.75 per cent for the calendar year 1922, an increase of 3.41 per cent.

The increase of $1,764,004.04 in "Income from Investments and Sources Other Than Transportation Operations" is due to net increase in dividends received on stocks owned and to credit of $374,293.41 received from the United States Government in final settlement of claims made by the companies for the Guaranty period, i.e., the six months ended August 31, 1920, for which period the Transportation Act, 1920 provided a guaranty equal to one-half the annual rental to which the carrier was entitled during Federal control, giving to the Interstate Commerce Commission, however, the power, in computing the net railway operating income for the purpose of the guaranty, to fix the amount allowable as expenses for maintenance of the properties and to disallow any items charged to other classes of expenses which in its opinion were disproportionate or unreasonable. The claims of the companies aggregated more than $4,000,000, being the difference between the net railway operating income of the companies for the Guaranty period and one-half the annual rental to which they were entitled during Federal control, but the Commission fixed the maintenance allowance for the Union Pacific companies at a much smaller amount than the companies actually expended for maintenance of the properties during the Guaranty period and thus fixed the amount above stated as due the companies.

The increase of $345,449.02 in "Fixed and Other Charges" represents principally the net of changes in interest on funded debt.

The increase of $15,149,322.34 or 10.7 per cent in "Freight Revenue" is due to an increase of 13.1 per cent in net ton miles of revenue freight carried, partly offset by a decrease in freight rates. As stated in the 1922 annual report, the Interstate Commerce Commission ordered a 10 per cent reduction effective July 1, 1922 in all rates not previously reduced since August 26, 1920 and reductions to aggregate 10 per cent in all rates that had been previously reduced a less amount. This, together with voluntary reductions made in rates on certain commodities caused the average level of freight rates for the first six months of 1923 to be approximately 8.5 per cent lower than the average level during the corresponding period of 1922. The principal causes for increase in volume of traffic carried were: (1) absence of strike conditions existing during 1922, and consequently a better car supply, particularly of refrigerator cars; (2) increased production of fruit, vegetables, live stock, kerosene, gasoline and naphtha in the intermountain and west coast territory; (3) generally improved market conditions, except for grain; and (4) improved building activities during the early months of 1923. Shipments of automobiles to the West increased greatly, the revenue therefrom amounting to $12,500,200, an increase of $4,489,800 or 56 per cent over 1922. The movement of grain during the year was off—particularly wheat—this being due to smaller winter wheat crop in Kansas and Nebraska, continued low prices and light foreign demand.

The increase of $2,105,637.46 or 6.1 per cent in "Passenger Revenue" is due to increase of 8.2 per cent in revenue passengers carried one mile, partly offset by decrease of 1.9 per cent in average revenue per passenger mile caused principally by increase in summer tourist travel at reduced rates. Revenue passengers carried decreased 5.2 per cent, the result of a further diversion of local short-haul business to motor vehicles.

TRANSPORTATION OPERATIONS

Operating results, for year 1923 compared with year 1922:

	Calendar Year 1923	Calendar Year 1922	Increase	Decrease	Per Cent
Average miles of road operated	9,482.56	9,405.67	76.89	.....	.8
Operating Revenues					
1. Freight revenue	$157,136,803.62	$141,987,481.28	$15,149,322.34	.....	10.7
2. Passenger revenue	36,076,470.20	33,972,832.74	2,103,637.46	.....	6.2
3. Mail revenue	4,556,941.57	4,482,520.55	74,421.02	.....	1.7
4. Express Revenue	4,748,252.97	4,819,475.67	.....	$71,222.70	1.5
5. Other passenger-train revenue	3,620,585.62	3,139,909.39	480,676.23	.....	15.3
6. Other train revenue	59,819.91	75,367.73	.....	15,547.82	20.6
7. Switching revenue	1,183,400.96	976,853.71	206,547.25	.....	21.1
8. Water line revenue	50,407.39	61,371.21	.....	10,963.82	17.9
9. Other revenue	3,885,783.07	3,361,309.38	524,473.69	.....	15.6
10. Total operating revenues	$211,318,465.31	$192,977,121.66	$18,441,343.65	.....	9.6
Operating Expenses					
11. Maintenance of way and structures	$30,801,361.58	$27,290,092.25	$3,511,269.33	.....	12.9
12. Maintenance of equipment	41,706,436.63	38,847,741.48	2,858,695.15	.....	7.4
13. Total maintenance expenses	$72,507,798.21	$66,137,833.73	$6,369,964.48	.....	9.6
14. Traffic expenses	3,644,869.01	3,446,424.29	198,444.72	.....	5.8
15. Transportation expenses—rail line	65,351,979.79	63,472,790.88	1,879,188.91	.....	3.0
16. Transportation expenses—water line	61,369.50	60,586.26	783.24	.....	1.3
17. Miscellaneous operations expenses	4,105,888.72	3,815,939.57	289,949.15	.....	7.6
18. General expenses	6,737,959.08	6,994,435.34	.....	$256,476.26	3.7
19. Transportation for investment—*Credit*	*160,784.04*	*81,780.73*	*79,003.31*	.....	96.6
20. Total operating expenses	$152,249,080.27	$143,846,229.34	$8,402,850.93	.....	5.8
21. Revenues over expenses	$59,069,385.04	$49,030,892.32	$10,038,492.72	.....	20.5
Taxes					
22. State and county	$9,990,486.77	$9,831,820.86	$158,665.91	.....	1.6
23. Federal capital stock	589,607.98	555,006.10	34,601.88	.....	6.2
24. Federal income	2,978,214.49	2,868,292.39	109,922.10	.....	3.8
25. Federal war revenue	14,757.39	*3,567.93*	18,325.32	.....	—
26. Total taxes	$13,573,066.63	$13,251,551.42	$321,515.21	.....	2.4
27. Uncollectible railway revenues	$21,783.69	$13,274.18	$8,509.51	.....	64.1
28. Railway operating income	$45,474,534.72	$35,766,066.72	$9,708,468.00	.....	27.1
29. Equipment rents (debit)	4,938,151.82	1,560,814.74	3,377,337.08	.....	216.4
30. Joint facility rents (debit)	876,137.37	708,934.05	167,203.32	.....	23.6
31. Net railway operating income	$39,660,245.53	$33,496,317.93	$6,163,927.60	.....	18.4
Per cent—Operating expenses of operating revenues	72.05	74.58	.....	2.53	3.4
Freight Traffic (*Commercial Freight only*)					
Tons of revenue freight carried	30,820,137	27,171,043	3,649,094	.....	13.4
Ton-miles, revenue freight	11,916,697,715	10,533,713,461	1,382,984,254	.....	13.1
Average distance hauled per ton (*miles*)	386.65	387.68	.....	1.03	.3
Average revenue per ton-mile (*cents*)	1.285	1.315	.....	.030	2.3
Average revenue per freight-train mile	$6.26	$6.46	.....	$.20	3.1
Passenger Traffic (*Excluding Motor Car*)					
Revenue passengers carried	6,090,985	6,425,306	.....	334,321	5.2
Revenue passengers carried one mile	1,142,848,606	1,056,202,331	86,646,275	.....	8.2
Average distance hauled per passenger (*miles*)	187.63	164.38	23.25	.....	14.1
Average passengers per passenger-train mile	60.73	56.54	4.19	.....	7.4
Average revenue per passenger-mile (*cents*)	3.129	3.189	.....	.060	1.9
Average revenue per passenger-train mile, passengers only	$1.90	$1.80	$.10	.....	5.6
Average total revenue per passenger-train mile	$2.59	$2.47	$.12	.....	4.9

Italics—Credit.

The increase of $74,421.02 or 1.7 per cent in "Mail Revenue" is due to ordinary fluctuations in business handled.

The decrease of $71,222.70 or 1.5 per cent in "Express Revenue" is due to a slight reduction in business handled.

The increase of $480,676.23 or 15.3 per cent in "Other Passenger-Train Revenue" is principally in sleeping-car revenue and dining and buffet revenue resulting from increase in passenger travel.

The increase of $206,547.25 or 21.1 per cent in "Switching Revenue" is due to increased volume of freight traffic handled.

The increase of $524,473.69 or 15.6 per cent in "Other Revenue" is principally in hotel and restaurant revenue due to increased passenger travel and in demurrage collections.

The increase of $3,511,269.33 or 12.9 per cent in "Maintenance of Way and Structurees Expenses" is principally due to 45.5 per cent more new rail laid in renewals and to more general repairs and renewals of bridges and other structures. The greater volume of work done entailed an increase of approximately $3,900,000, of which about $1,850,000 was for increased forces—the wage level being about the same as in previous year; about $1,450,000 for materials (but for reduction in prices this would have been about $2,100,000); and about $600,000 miscellaneous, being the net for contract work, work train expenses, property retirements, material sales, etc. There was a decrease of about $400,000 due to direct strike expenses charged to maintenance of way and structures accounts in 1922.

The principal track materials used during the year in making renewals were as follows:

New steel rails	424.10 track miles
Second-hand steel rails	164.23 track miles
Total	588.33 track miles

excluding yard tracks and sidings, equivalent to 5.9 per cent of the track miles in main track at the beginning of the year. Ties 3,039,197 (75.0 per cent treated) equivalent to 8.3 per cent of all ties in track at the beginning of the year. Tie plates 2,613,715 and continuous rail joints 239,653.

The increase of $2,858,695.15 or 7.4 per cent in "Maintenance of Equipment Expenses" is principally due to the necessity of restoring locomotives to the usual high state of efficiency below which they necessarily were at the end of the previous year as a result of the strike of mechanical employes which started July 1, 1922; to the greater volume of business handled necessitating more repairs—locomotive miles increased 8.9 per cent, car miles 21.3 per cent and gross ton miles 21.7 per cent—and to depreciation charges on additional units of equipment owned. By reason of the increase in work done labor costs increased about $1,100,000 and the cost of materials applied in repairs increased about $3,200,000—but for reductions in wage schedules and premium time payments and in the prices of materials, these increases would have been substantially greater. There was a decrease of about $1,660,000 due to direct strike expenses charged to maintenance of equipment accounts in 1922.

The increase of $198,444.72 or 5.8 per cent in "Traffic Expenses" is principally due to increase in expenditures for advertising and solicitation.

The increase of $1,879,188.91 or 3 per cent in "Transportation Expenses—Rail Line" is due to increase of 21.7 per cent in freight gross ton miles and 8.9 per cent in total locomotive miles, this increased business causing an increase of about $2,400,000 for increased forces, the average wage level being about the same as for 1922. Although there was an increase in fuel and other supplies consumed in operations, the cost thereof was about $200,000 less than for 1922 due to substantial reduction of prices, particularly for locomotive fuel. There were decreases of about $400,000 due to direct strike expenses charged to transportation accounts in 1922 and about $400,000 in charges for loss, damage and other casualties, partly offset by miscellaneous small increases.

The increase of $289,949.15 or 7.6 per cent in "Miscellaneous Operations Expenses" is principally due to increase in volume of passenger business handled, dining and buffet revenue having increased 9.6 per cent and hotel and restaurant revenue 17.9 per cent.

The decrease of $256,476.26 or 3.7 per cent in "General Expenses" is principally due to decrease in payments for premiums on employes health and accident insurance which was abolished effective January 1, 1923, group life insurance being continued same as before and extended as of that date to the Los Angeles & Salt Lake R. R. also.

The increase of $3,377,337.08 or 216.4 per cent in "Equipment Rents (Debit)" is due to increase in number of carloads of perishable and other commodities handled and to the storage of freight cars in expectation of the usual grain movement which, however, did not materialize to the usual extent during the last quarter of the year. Of the increase, $1,331,130 is due to increased number of box cars and other railroad owned equipment on line; $1,730,161 to payments to the Pacific Fruit Express Company (of which Union Pacific is half owner) for mileage of refrigerator cars occasioned by the increase in the number of carloads of perishable business handled; and $252,530 to payments to private car lines for mileage of tank cars occasioned by the increase in the number of carloads of oil and oil products handled. Due to a car shortage in 1922 the total number of cars on Union Pacific lines was

equivalent to only 92.1 per cent of its ownership and equipment rents were obviously subnormal, having decreased $2,473,529.13 under 1921. In 1923 no such shortage existed, the number of cars on Union Pacific lines for that year being 103.5 per cent of its ownership.

The *increase* in "Investment in Road and Equipment" is made up as follows:

Extensions and branches		$2,470,610.84
Additions and betterments, *excluding Equipment*		16,248,072.15
Equipment		12,056,876.77
Total increase		$30,775,559.76
From which there was deducted:		
Cost of property retired from service and not to be replaced, *charged (less salvage) to Profit and Loss in conformity with regulations of the Interstate Commerce Commission*	$291,310.22	
Cost of real estate sold	64,744.12	
Cost of equipment retired from service	1,468,787.78	
Total deductions		1,824,842.12
Net increase in "Investment in Road and Equipment"		$28,950,717.64

GENERAL

A line known as the Grass Creek Branch extending from Grass Creek Junction, Utah, a point on the Park City Branch, easterly a distance of 5.75 miles was purchased in November, 1923, from the Zion's Securities Corporation and rehabilitated. Previous to the purchase, this track, which serves coal mines, was operated by the Union Pacific under lease.

A small branch line 5.37 miles in length was constructed from the Park City Branch in a southeasterly direction to the east portal of the Ontario Drain Tunnel of the Park City Mining Company at Keatley, Utah, as a means of increasing ore traffic from mines operating through the drain tunnel. The branch was opened for operation on December 15, 1923.

Construction of the Santa Ana Branch in Southern California was continued during the year, the line from Whittier to Anaheim, a distance of 17.49 miles, being placed in operation May 2, 1923.

A branch line from Lund, Utah, extending southeasterly 33.17 miles to Cedar City, Utah, was constructed and opened to the public for traffic on July 2, 1923. This extension was built primarily to provide facilities for the transportation of iron ore from deposits around Iron Springs, a point about 22 miles southeast of Lund, to new steel mills being constructed by the Columbia Steel Company on Utah Lake near Provo, Utah. It is estimated that the iron deposits around Iron Springs contain 400,000,000 tons. This branch line will also serve an area heretofore without immediate railroad facilities containing approximately 840,000 acres, of which 800,000 are used for grazing and 40,000 are cultivated. It is estimated that 43,000 acres may be brought under cultivation by irrigation, and there is also a large area on which certain crops can be grown without irrigation. The Sevier National Forest Reserve lies about 15 miles east of Cedar City, and contains about 300,000,000 feet of timber suitable for lumber and other timber from which approximately 350,000 ties can be cut. The new line affords a convenient means of access to Zion National Park, the north rim of the Grand Canyon, Cedar Breaks, Bryce Canyon and other points of national interest, which it is believed will create a substantial increase in tourist passenger traffic. In anticipation of this tourist business, hotel and camp facilities are being constructed at Cedar City, Bryce Canyon and Cedar Breaks, and the Utah Parks Company, which was incorporated in the State of Utah March 29, 1923, and whose entire capital stock is owned by the Los Angeles & Salt Lake Railroad Company, will construct camp and hotel facilities in Zion National Park, and will operate motor buses between Cedar City and the hotels and camps.

GENERAL BALANCE SHEET—ASSETS

(Excluding all offsetting securities and accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co.)

		December 31, 1923	December 31, 1922	Increase	Decrease
INVESTMENTS:					
	Road and equipment	$826,808,565.54	$797,857,847.90	$28,950,717.64	.....
	Less:				
	Receipts from improvement and equipment fund	$23,823,091.13	$23,823,091.13	.....	.....
	Appropriations from income and surplus prior to July 1, 1907, credited to this account	13,310,236.52	13,310,236.52	.....	.....
	Total	$37,133,327.65	$37,133,327.65	.....	.....
701.	Investment in road and equipment	$789,675,237.89	$760,724,520.25	$28,950,717.64	.....
702.	Improvements on leased railway property	$11,378.13	$10,564.18	$813.95	.....
704.	Deposits in lieu of mortgaged property sold	1,172,655.54	8,197.48	1,164,458.06	.....
705.	Miscellaneous physical property	3,064,944.54	3,193,160.33	.....	$128,215.79
	Total	$4,248,978.21	$3,211,921.99	$1,037,056.22	.....
706.	Investments in affiliated companies:				
	Stocks	$20,554,082.93	$13,334,448.33	$7,219,634.60	.....
	Bonds and notes	15,231,670.68	8,831,310.68	6,400,360.00	.....
	Advances	9,222,698.79	11,468,233.63	.....	$2,245,534.84
	Total	$45,008,452.40	$33,633,992.64	$11,374,459.76	.....
707.	Investments in other companies:				
	Stocks	$85,999,253.40	$83,749,253.40	$2,250,000.00	.....
	Bonds, notes, and equipment trust certificates	82,261,637.32	87,848,420.06	.....	$5,586,782.74
	Total	$168,260,890.72	$171,597,673.46	.....	$3,336,782.74
	United States Government Bonds and Notes	$38,315,145.00	$28,315,095.00	$10,000,050.00	.....
703.	Sinking funds	$173,045.03	$236,810.79	.....	$63,765.76
	Total investments	$1,045,681,749.25	$997,720,014.13	$47,961,735.12	.....
CURRENT ASSETS:					
708.	Cash	$17,272,301.24	$5,781,870.14	$11,490,431.10	.....
709.	Demand loans and deposits	.....	11,500,000.00	.....	$11,500,000.00
711.	Special deposits	183,354.06	68,864.30	114,489.76	.....
712.	Loans and bills receivable	17,535.37	2,579,613.79	.....	2,562,078.42
713.	Traffic and car service balances receivable	5,944,496.60	5,999,567.12	.....	55,070.52
714.	Net balance receivable from agents and conductors	1,536,615.12	1,755,142.07	.....	218,526.95
715.	Miscellaneous accounts receivable	5,397,990.99	5,065,298.67	332,692.32	.....
716.	Material and supplies	23,676,833.31	23,781,184.51	.....	104,351.20
717.	Interest and dividends receivable	1,716,265.36	1,785,759.75	.....	69,494.39
718.	Rents receivable	165,012.96	169,107.00	.....	4,094.04
719.	Other current assets:				
	Baltimore and Ohio Railroad Co. capital stock applicable to payment of extra dividend of 1914	179,622.20	194,138.20	.....	14,516.00
	Miscellaneous items	121,774.68	60,616.97	61,157.71	.....
	Total current assets	$56,211,801.89	$58,741,162.52	.....	$2,529,360.63
DEFERRED ASSETS:					
720.	Working fund advances	$78,799.06	$75,355.65	$3,443.41	.....
722.	Other deferred assets:				
	Land contracts, as *per contra*	214,785.33	302,497.21	.....	$87,711.88
	Miscellaneous items	3,164,546.91	4,256,067.13	.....	1,091,520.22
	Total deferred assets	$3,458,131.30	$4,633,919.99	.....	$1,175,788.69
UNADJUSTED DEBITS:					
723.	Rents and insurance premiums paid in advance	$4,603.86	$2,972.37	$1,631.49	.....
725.	Discount on funded debt	1,175,443.56	1,207,073.59	.....	$31,630.03
727.	Other unadjusted debits:				
	U. S. Government guaranty period claim, as *per contra*	.....	4,448,319.91	.....	4,448,319.91
	Miscellaneous items	2,185,130.47	1,965,697.78	219,432.69	.....
	Total Unadjusted debits	$3,365,177.89	$7,624,063.65	.....	$4,258,885.76
	Grand total	$1,108,716,860.33	$1,068,719,160.29	$39,997,700.04	.....

GENERAL BALANCE SHEET—LIABILITIES

(Excluding all offsetting securities and accounts between the Union Pacific Railroad Co., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., and Los Angeles & Salt Lake Railroad Co.)

		December 31 1923	December 31 1922	Increase	Decrease
751.	Capital Stock:				
	Common stock	$222,293,100.00	$222,293,100.00	.....	.....
	Preferred stock	99,543,500.00	99,543,500.00	.....	.....
	Total capital stock	$321,836,600.00	$321,836,600.00	.....	.....
755.	Funded Debt	413,586,595.00	387,980,875.00	$25,605,720.00	.....
	Total	$735,423,195.00	$709,817,475.00	$25,605,720.00	.....
754.	Grants in Aid of Construction	$108,098.93	$77,979.31	†$30,119.62	.....
	CURRENT LIABILITIES:				
759.	Traffic and car service balances payable	$1,550,827.77	$2,220,935.27	.....	$670,107.50
760.	Audited accounts and wages payable	13,331,932.88	17,123,791.02	.....	3,791,858.14
761.	Miscellaneous accounts payable:				
	Due to affiliated companies	9,988,685.53	7,457,831.84	$2,530,853.69	.....
	Other accounts payable	224,921.39	212,523.56	12,397.83	.....
762.	Interest Matured Unpaid:				
	Coupons matured, but not presented	193,753.05	213,617.15	.....	19,864.10
	Coupons, and interest on registered bonds, due first proximo	5,082,832.40	5,084,945.40	.....	2,113.00
763.	Dividends Matured Unpaid:				
	Dividends due but uncalled for	106,807.50	125,710.00	.....	18,902.50
	Extra dividend on common stock declared January 8, 1914, payable to stockholders of record March 2, 1914, unpaid	192,741.49	209,345.96	.....	16,604.47
	Dividend on common stock payable first proximo	5,557,290.00	5,557,290.00	.....	.....
764.	Funded debt matured unpaid	8,000.00	25,000.00	.....	17,000.00
766.	Unmatured interest accrued	1,658,423.09	1,282,366.66	376,056.43	.....
767.	Unmatured rents accrued	478,833.80	364,687.93	114,145.87	.....
768.	Other current liabilities	1,022,627.51	97,638.27	924,989.24	.....
	Total current liabilities	$39,397,676.41	$39,975,683.06	.....	$578,006.65
	DEFERRED LIABILITIES:				
770.	Other Deferred Liabilities:				
	Principal of deferred payments on land contracts, as *per contra*	$214,785.33	$302,497.21	.....	$87,711.88
	Contracts for purchase of real estate	1,660,000.00	1,660,000.00	.....	.....
	Miscellaneous items	706,516.61	507,420.02	$199,096.59	.....
771.	Tax liability	8,727,888.41	7,001,966.34	1,725,922.07	.....
	Total deferred liabilities	$11,309,190.35	$9,471,883.57	$1,837,306.78	.....
	UNADJUSTED CREDITS:				
773.	Insurance Reserve:				
	Reserve for fire insurance	$1,391,535.83	$1,117,637.66	$273,898.17	.....
776.	Reserve for depreciation	46,128,288.26	41,972,709.11	4,155,579.15	.....
778.	Other Unadjusted Credits:				
	Contingent interest	678,366.09	678,366.09	.....	.....
	Guaranty period claim—U. S. Government—unadjusted as *per contra*	.....	4,448,319.91	.....	$4,448,319.91
	Miscellaneous items	10,643,993.89	10,050,213.55	593,780.34	.....
	Total unadjusted credits	$58,842,184.07	$58,267,246.32	$574,937.75	.....
	Total liabilities	$845,080,344.76	$817,610,267.26	$27,470,077.50	.....
	SURPLUS:				
	Appropriated for additions and betterments	$29,393,716.03	$29,260,114.13	†$133,601.90	.....
	Reserved for depreciation of securities	34,740,468.50	34,740,468.50	.....	.....
	Funded debt retired through income and surplus	496,413.80	414,671.02	81,742.78	.....
	Sinking fund reserves	190,317.40	245,208.54	.....	$54,891.14
	Total appropriated surplus	$64,820,915.73	$64,660,462.19	$160,453.54	.....
784.	Profit and loss—Credit balance	167,143,109.54	154,776,818.08	12,366,291.46	.....
	Total surplus	$231,964,025.27	$219,437,280.27	$12,526,745.00	.....
	As this consolidated balance sheet excludes all intercompany items, securities of the Los Angeles & Salt Lake Railroad Company owned by other System companies are not included. The difference between the par and face value of such securities as carried on the books of the Los Angeles & Salt Lake (less unextinguished discount on the bonds and discount charged to Profit and Loss but added back in consolidating the accounts) and the amounts at which the securities are carried on the books of the owning System companies is set up here to balance	$31,672,490.30	$31,671,612.76	$877.54	.....
	Grand total	$1,108,716,860.33	$1,068,719,160.29	$39,997,700.04	.....

†These amounts respectively represent donations made during the year by counties and municipalities and by individuals and companies in part payment for improvements, such as road crossings, drainage projects, and industry spur tracks, the cost of which was charged to "Investment in Road and Equipment."

Other extensions and branches in the course of construction during the year were: Ammon, Idaho southwesterly, a distance of 10.8 miles to a connection with the northern end of the Dumas Branch, this extension to serve an area of 10,000 acres of highly developed irrigated land now under cultivation and a tributary area of 5,000 acres of pasture land. Orchard, Idaho, northwesterly a distance of 27.78 miles, through the City of Boise to a connection with the present Nampa-Boise line at a point east of Perkins. Incident to the construction of this extension a small loop 2.66 miles in length is being constructed from M. P. 2.43 on the Boise Branch to the east end of yard at Nampa, Idaho. Some minor expenditures were also made in connection with the construction of the new branch line from Rogerson, Idaho, southerly to Wells, Nevada, a distance of 94.27 miles, which branch when completed will give Southern Idaho a direct rail outlet to San Francisco, and will open up copper mining properties adjacent to the new line.

The undersigned felt obliged by considerations of health to resign as Chairman of the Executive Committee and chief executive of the companies at the end of the year, but remained as Chairman of the Board of Directors, with direction and supervision of the interests of the companies in all matters of consolidation and valuation of railroad properties pursuant to Acts of Congress, and as *ex officio* a member of all committees of the Board. In accordance with the plan worked out by the Chairman and Executive Committee, the Board of Directors of each System company on October 11, 1923, amended the By-Laws, effective January 1, 1924:

1. By creating, in place of the Executive Committee, a Finance Committee to have charge of all financial affairs and investments of the company and possess all the powers of the Board of Directors when the Board is not in session. The Finance Committee of each of the companies is now composed of Directors Charles A. Peabody, Chairman; Newcomb Carlton, W. A. Harriman, C. B. Seger, Paul M. Warburg, and Robert S. Lovett, *ex officio*.

2. By enlarging the responsibilities of the President and placing him in full charge of the operations of the properties in the West, subject to the usual control of the Board of Directors and specific control by the Finance Committee in regard to larger capital expenditures and undertakings.

3. By placing the New York Office in charge of the Comptroller, who was elected a Vice-President and who shall be the channel of communication and information between the President and the Finance Committee.

By order of the Board of Directors,
ROBERT S. LOVETT, *Chairman*

[ADVERTISEMENT]

Railway Officers

Financial, Legal and Accounting

J. P. Plunkett has been appointed attorney in the legal department of the Great Northern, with headquarters at St. Paul, Minn.

J. W. Maclachlan has been elected assistant secretary of the Atchison, Topeka & Santa Fe, with headquarters at New York, succeeding L. C. Deming, who has been elected comptroller.

Laurent C. Deming, assistant secretary of the Atchison, Topeka & Santa Fe, with headquarters at New York, has been elected comptroller, succeeding D. L. Gallup, deceased. Mr. Deming was born at Hartford, Conn., and was graduated from Yale University in 1883. Practically all of his railway service has been with the Atchison, Topeka & Santa Fe, with which company he became connected in 1889 in the reorganization work of that year in New York. In 1890 he was appointed assistant secretary of the company, with headquarters at Boston, Mass. Upon the completion of the organization of the company in 1895 his headquarters were changed to New York, where Mr. Deming has been ever since. Latterly he has served also as clerk to the board of directors and the executive committee. He is a director of several railway and other corporations.

Operating

W. E. Merrifield, who has been on leave of absence, has resumed his duties as superintendent of the Eastern division of the Missouri Pacific, with headquarters at Jefferson City, Mo.

C. S. Millard, assistant general superintendent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Indianapolis, Ind., has been promoted to general manager, with headquarters at Cincinnati, Ohio, succeeding **E. M. Costin,** who has retired on account of ill health.

W. U. Appleton, general superintendent of the Atlantic region of the Canadian National, with headquarters at Moncton, N. B., has been promoted to general manager, with the same headquarters, succeeding L. S. Brown, deceased. **R. W. Simpson,** assistant to the general manager of the Atlantic region, has been promoted to assistant general manager. **W. R. Davidson,** general superintendent of the Central region, with headquarters at Montreal, Que., has been transferred to the lines west of the Detroit and St. Clair rivers. **F. L. C. Bond,** chief engineer of the Central region, with headquarters at Toronto, Ont., has been promoted to general superintendent of the Central region, with headquarters at Montreal, succeeding Mr. Davidson.

H. J. **Humphrey,** whose promotion to general superintendent of the Algoma district of the Canadian Pacific, with headquarters at North Bay, Ont., was announced in the *Railway Age* of March 22, page 819, entered railway service in 1896 as a telegraph operator for the Intercolonial Railway. The following year he entered the service of the Boston & Maine in a similar capacity and remained until 1901 when he returned to the Intercolonial. In 1902 he went with the Canadian Pacific as a telegraph operator and a year later was promoted to train dispatcher. In 1911 he became chief train dispatcher at McLeod, Alta., and the following year was promoted to car service and fuel agent of the Saskatchewan district with headquarters at Moose Jaw, Sask. In 1915 he was promoted to superintendent of car service, Western lines, with headquarters at Winnipeg, Man., and in the latter part of 1916 was transferred in a similar capacity to the Eastern lines with headquarters at Montreal. In 1916 he was promoted to superintendent at Farnham, Que., and in August, 1922, Mr. Humphrey was promoted to assistant general superintendent of the Ontario district, with headquarters at Toronto, the position he held at the time of his promotion.

Engineering, Maintenance of Way and Signaling

T. T. Irving, chief engineer of the Grand Trunk, Western lines, with headquarters at Detroit, Mich., has been transferred to the Central region, with headquarters at Toronto, Ont., succeeding F. L. C. Bond, promoted.

H. T. Hazen, assistant chief engineer of the Central region of the Canadian National, with headquarters at Toronto, Canada, has been transferred to Montreal as assistant chief engineer, operating department. The former position has been abolished.

A. H. Johnson, formerly assistant engineer (electrical) in the office of the superintendent of telegraph of the Southern, with headquarters at Charlotte, N. C., has been promoted to telegraph and telephone engineer in the office of the general superintendent of telegraph, with headquarters at Washington, D. C.

The following appointments have been announced in the engineering and maintenance of way departments of the Chesapeake & Ohio: **W. C. Pinschmidt,** assistant engineer; **W. H. Sparks,** general inspector of track; **Walter Constance,** supervisor of reclamation; **C. H. Zentmyer,** assistant engineer; **W. J. Whipple,** general inspector of track.

Traffic

W. E. Johnson has been appointed commericial agent for the Green Bay & Western, with headquarters at Chicago.

D. J. Collins has been appointed assistant general freight agent of the Missouri-Kansas-Texas, with headquarters at St. Louis, Mo.

R. V. Oldham, passenger and ticket agent for the Wabash, with headquarters at Ft. Wayne, Ind., has been promoted to district passenger agent, with headquarters at Indianapolis, Ind.

M. G. Clark, traveling freight agent for the Wabash, with headquarters at Omaha, Nebr., has been promoted to division freight agent, with headquarters at Springfield, Ill., succeeding W. L. Bowlus, deceased.

E. F. Schier, traveling freight agent for the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to district traffic agent, with headquarters at Louisville, Ky., succeeding J. P. Bernia, who has resigned.

Sam Jones has been appointed assistant general agent of the Seaboard Air Line, **E. R. Mathews** has been appointed passenger agent and **P. R. Howard** has been appointed commercial agent, all with headquarters at St. Petersburg, Fla.

J. W. Brady, in addition to his duties as general agent of the Clover Leaf district of the New York, Chicago & St. Louis, with headquarters at Detroit, Mich., has been appointed general agent of the Nickel Plate district, with the same headquarters.

F. N. Hicks, general agent of the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., has been promoted to assistant traffic manager, with headquarters at Seattle, Wash., succeeding J. R. Veitch, whose death on February 12 was reported in the *Railway Age* of February 16.

P. C. McCormick, district freight representative of the Baltimore & Ohio, with headquarters at Milwaukee, Wis., has been promoted to district freight agent, with headquarters at Chicago. **R. L. Sponenberger** has been appointed district freight representative at Milwaukee, succeeding Mr. McCormick.

B. F. Parsons, assistant general freight agent of the Chicago Great Western, with headquarters at Chicago, has been promoted to general freight agent, with the same headquarters, succeeding Oscar Townsend, whose promotion to traffic manager was reported in the *Railway Age* of April 12. **G. R. McLean** has been appointed assistant general freight agent, with headquarters at Chicago, succeeding Mr. Parsons.

R. C. Trovillion, assistant general freight agent of the Missouri-Kansas-Texas, with headquarters at St. Louis, Mo., has been

promoted to general freight agent with the same headquarters, succeeding W. W. Miller, whose death on March 15 was reported in the *Railway Age* of March 22. Mr. Trovillion was born on August 26, 1887, at Golconda, Ill., and entered railway service in July, 1906, in the freight department of the Chicago & Alton at St. Louis, Mo. Shortly thereafter he entered the service of the Missouri-Kansas-Texas as rate clerk in the freight traffic department. He was subsequently promoted to chief clerk and then to division freight agent, with headquarters at St. Louis, Mo. Mr. Trovillion was promoted to assistant general freight agent, with the same headquarters, on March 1, 1920, and he continued in that position until his recent promotion to general freight agent.

Special

H. J. Forster, assistant general secretary and treasurer of the American Railway Association with headquarters at New York, has been appointed secretary and treasurer, succeeding J. E. Fairbanks, deceased. Mr. Forster was born in Jersey City, N. J., and attended high school there. In 1906 he entered the service of the United States Express Company, which position he resigned a year later to become a stenographer in the offices of the American Railway Association. In 1913 he was promoted to chief clerk and, in 1915, to assistant treasurer. In 1919 he became also assistant general secretary, in which position he was serving at the time of his recent advancement. Mr. Forster was recording secretary of the Railroad's War Board in 1917 prior to federal control.

The Chicago, Burlington & Quincy has reorganized its pension, relief and employment departments. **J. N. Redfern,** superintendent of the relief and employment department, with headquarters at Chicago, has been appointed manager of the relief, medical, employment and pension departments. **J. T. Williamson,** chief clerk in the relief department, has been promoted to superintendent of the relief department, with headquarters at Chicago. **W. C. Kordsiemon,** assistant superintendent of the employment department, with headquarters at Chicago, has been promoted to superintendent of the employment department, with the same headquarters. **J. R. King,** assistant secretary of the Board of Pensions has been promoted to secretary of the Board of Pensions, with headquarters at Chicago. **Dr. J. A. Denney,** assistant superintendent of the relief department and medical director, has retired on account of ill health. **Dr. D. B. Moss** has been appointed chief medical and surgical officer, with headquarters at Chicago.

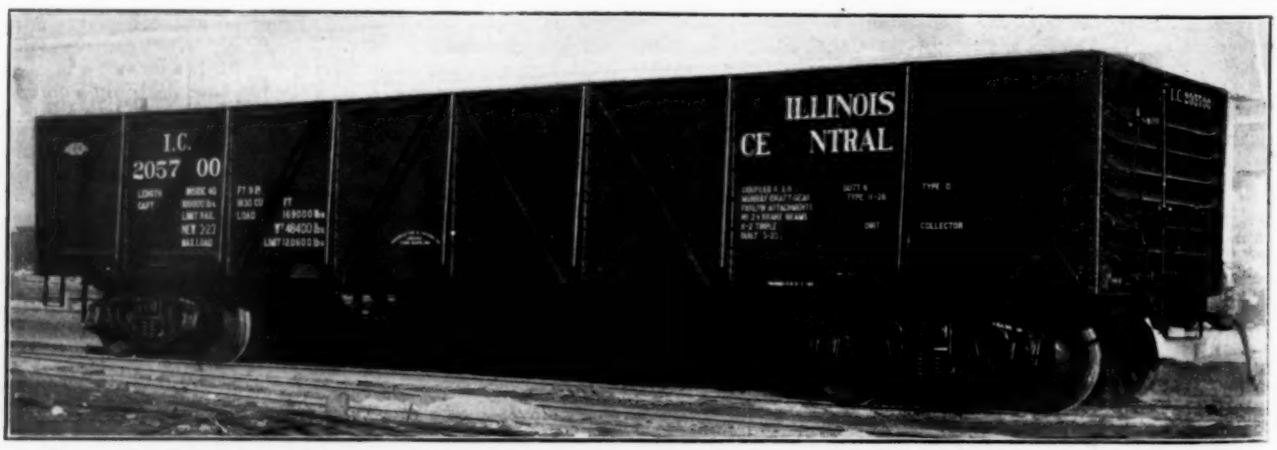
Obituary

P. Walsh, general baggage agent of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., died in that city on April 13.

F. H. Watts, assistant to the chief engineer maintenance of way of the Central region of the Pennsylvania, with headquarters at Pittsburgh, Pa., died in that city on April 13. Mr. Watts was born on March 29, 1876, at Natick, Mass., and graduated from the Massachusetts Institute of Technology in 1897. He entered railway service in June, 1899, in the engineering department of the Chicago & North Western. In June, 1900, he entered the service of the Pennsylvania and in January, 1904, was promoted to assistant division engineer. Mr. Watts was subsequently promoted to division engineer and in March, 1920, was promoted to engineer maintenance of way of the Illinois division. He held this position until February, 1924, when he was appointed assistant to the chief engineer maintenance of way of the Central region.

I. L. Hibbard, assistant to the vice-president in charge of operation of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., died in that city on April 12. Mr. Hibbard had been in poor health for more than a year and had been on leave of absence for the greater part of that time. He was born on July 8, 1857, at Woodhull, N. Y., and entered railway service in 1876 as a warehouseman for the Erie, and later served as freight clerk. From 1881 to 1884 he was employed as a stenographer in the general freight office of the Indianapolis & St. Louis, at St. Louis, Mo., and from 1884 to 1886 he held a similar position in the office of the master of transportation of the Wabash, St. Louis & Pacific. In 1886 Mr. Hibbard was appointed trainmaster of the latter road and served in that capacity until 1890 when he was appointed trainmaster of the Southern California. In December, 1896, he was appointed agent of the same road at Los Angeles, Cal., and in October, 1897, became superintendent of the Albuquerque division of the Santa Fe Pacific, now a part of the Atchison, Topeka & Santa Fe, at Winslow, Ariz. From October 1, 1903 to February 1, 1905, he was superintendent of the Los Angeles division of the Atchison, Topeka & Santa Fe, with headquarters at San Bernardino, Cal., and on February 1, 1905, he was appointed general superintendent of the Santa Fe Coast Lines at Los Angeles, Cal. On November 1, 1916, Mr. Hibbard was promoted to assistant general manager of the same lines and on January 1, 1920, he was promoted to general manager. In February, of the present year, he was appointed assistant to the vice-president in charge of operation, the position he held at the time of his death.

I. L. Hibbard



50-Ton Composite Gondola Car Built by American Car & Foundry Company for Illinois Central